

wood.

## GoTechnology® hub2

Functional Specification

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# 1 Overview

## 1.1 About This Document

### 1.1.1 Introduction

This specification describes hub2; *qed*'s next generation project management solution.

The document contains example page layouts which are intended only as a general indication of layout and functionality and not as an accurate representation of the finished product.

### 1.1.2 Intended Audience

It would be beneficial, but not essential, for the reader to have familiarity with other *qed* Software products. It is assumed that the reader broadly understands the purpose and value of the products with-in, and any concepts related both to the management of commissioning work, and general knowledge in information storage, however it is not necessary to be a subject matter expert in any of these areas to understand this specification.

### 1.1.3 Conventions in this document

## IMPORTANT

### Familiarity with the conventions listed will improve your reading experience.

The following conventions exist within this document:

- 1) When referring to entities, the Entity name will be double underlined, e.g. the Cables Entity.
- 2) When referring to entities, the Entity and fields name will include proper spacing, e.g. the Tag ITR Entity. In the actual implementation, any spaces will be removed (e.g. in the database itself the name would be "TagITR")
- 3) When referring to specific fields, whether on page, on Imports/Exports or within Entity definitions:
  - a. **Bold** indicates this is a required field, which cannot be blank.
  - b. *Italic* indicates this is a reference field from another table.
  - c. **Bold and italic** indicates both above are true.
- 4) Types, such as **String**, **Int** and **Guid** will be written using the **Type** style, which is blue and utilises the Consolas font.
- 5) Names of fields and variables (e.g. ID, Name, Completed By, Description) will be written in the Name style, with broken underline.
- 6) Quotation marks:
  - a. "Double" quotation marks are used to refer to on-screen elements or to quote directly from a source.
  - b. 'Single' quotation marks are used to enclose unfamiliar/unusual/technical language (on initial use only, subsequent uses do not need to be enclosed in quotes) and to refer to the title of a source.

As such, a correct use of quotation marks would be:



The “Delete” for the ‘Equimantronixor’ (a made-up piece of equipment used in demonstrating quote usage) will be shown in red. This follows the guidelines from ‘The Made-Up Style Guide’ by A.N. Other, which states that “All delete buttons should be red.” When the button is clicked the Equimantronixor will be deleted.

- 7) Tables will utilise the following format, heading and style, based on their purpose:
- UI tables; to provide a listing of UI elements.

UI Element	Type	Description	User Restrictions	Feature Restrictions
Name of Element #1	Type #1	Description of Element #1	User restrictions #1	Feature restrictions #1
Name of Element #2	Type #2	Description of Element #2	User restrictions #2	Feature restrictions #2

Table 1. Example UI table.

- Entity tables; to provide listing of an Entity's attributes.

Attribute	Type
<b>Name of attribute #1 (bold for required field)</b>	Type (Other information such as length)
<b>Name of attribute #2 (bold and italic as primary and foreign key)</b>	Type (Other information such as length)
<i>Name of attribute #3 (italic as foreign key)</i>	Type (Other information such as length)
Name of attribute #4	Type (Other information such as length)

Table 2. Example Entity table

- Results table; to provide listings of search results, views, exports and similar.

Field	Path	Type	Sortable
Name #1	Path #1	Type #1	Yes / No
Name #2	Path #2	Type #2	Yes / No

Table 3. Example Result table.

- Misc./General table; for all other purposes not covered by the above.



Header A	Header B	Header C	Header D
A #1	B #1	C #1	D #1
A #2	B #2	C #2	D #2

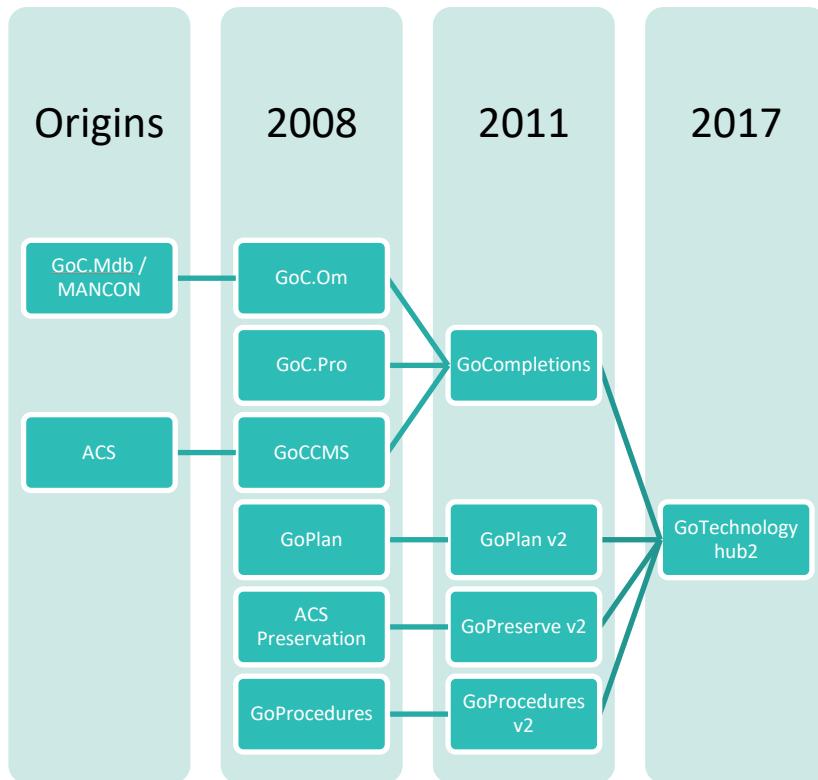
Table 4. Example Misc./General table.

## 1.2 About GoTechnology hub2

### 1.2.1 What is GoTechnology hub2?

Intended as a replacement for the current generation of GoTechnology®, hub2 is a project management solution that will encompass what was previously an entire suite of products.

It is not an upgrade to existing software but an entirely new build.



### 1.2.2 Presentation

#### 1.2.2.1 How should I write hub2?

The correct way is to use all lower-case letters, with no space between the word “hub” and the number “2”. This is to replicate the style of a URI; written all lower case, with spaces omitted, e.g. hub2.gotechnology.online. This links the name/brand of the product with its nature as web-based technology.

### 1.2.3 Restrictions and Conventions in hub2

#### 1.2.3.1 Use of “Name” and “Number” in/as field names.

The use of “Name” or “Number” in field names (e.g. Tag Name, which will be displayed on page as “Tag”) are reserved and should be used in the following situations only:

1. As the identifying field (or part of the identifying field) of an Entity (e.g. the Name field for most entities or the Number field on a limited number of entities such as Procedure Step, Procedure Section etc.)

Or

2. In conjunction with an Entity name to link to that Entity (e.g. the use of Discipline Name, which will be written on page as “Discipline” in the Tag Entity, to link to the Discipline Entity).

## 1.2.4 Versioning

Versioning in hub2 will follow the convention established in Semantic Versioning 2.0.0 (Preston-Werner, 2017) which describes a three-part number is to be used as follows:

*“Given a version number MAJOR.MINOR.PATCH, increment the:*

- 1.1.1.1.1.1.1 MAJOR version when you make incompatible API changes,*
  - 1.1.1.1.1.1.2 MINOR version when you add functionality in a backwards-compatible manner, and*
  - 1.1.1.1.1.1.3 PATCH version when you make backwards-compatible bug fixes.*

*Additional labels for pre-release and build metadata are available as extensions to the MAJOR.MINOR.PATCH format.”*



## 2 General

### 2.1 Data Organisation

Within hub2 there will be several levels of data organisation. In the previous generation of GoTechnology® these used titles like “Project”, “Asset” and “Asset Group”, however to provide a more generic solution, these will instead be referred to alphabetically in hub2.

#### 2.1.1 Level A

##### 2.1.1.1 Definition

Level A is the ‘company’/‘tenant’ level, and represents settings that are company-wide for the client.

Typically, there will be a single Level A per instance of hub2.

##### 2.1.1.2 Members

The following Entities are members of Level A and are configured and defined by Users at this level:

- Level B

#### 2.1.2 Level B

##### 2.1.2.1 Definition

Level B is the ‘region’/‘sector’, and could represent either a geographic area such as a continent, or an industry such as oil & gas or mining. Every subsequent level will utilise the same settings for information set at Level B, e.g. as the Disciplines are set at this level every “Asset” (Level C), every “Project” (Level D) and every “Scope of Work” (Level E) will all use that same Discipline list. Users of those Levels will be able to select from these values but not add, update or delete.

##### 2.1.2.2 Members

The following Entities are members of Level B and are configured and defined by Users at this level:

- Level C
- Default Sign Off
- Discipline
- Drawing Type
- Ex Certifying Body
- Ex IP Rating
- Ex Protection
- Ex Rated Model
- Ex Zone
- ITR Class
- Material Type
- Preservation Completion Status
- Procedure Category
- Procedure Completion Status
- Procedure Skeleton
- Procedure Skeleton Section



- [Procedure Skeleton Step](#)
- [Procedure Type](#)
- [Punch List Item Category](#)
- [Tag ITR Completion Status](#)
- [Digital Document Check Box Type](#)
- [Test Pack Type](#)
- [Unit Of Measure](#)
- [Vendor](#)

### **2.1.3 Level C**

#### **2.1.3.1 Definition**

Level C is the ‘asset’/‘facility’. This level represents a physical location, a commercial or industrial property or a vessel, such as a Coal Mine, a Nuclear Power Plant, an Oil Rig or an FPSO (Floating Production, Storage and Offloading). Child levels (Level D and Level E) of a Level C Entity will all utilise the same information defined for this Level C. For example, all “Projects” (Level D) and all “Scopes of Work” (Level E) within this “Facility” (Level C) will use the same Drawing list, Equipment Types, ITRs etc. (full membership list detailed below). They will be able to select from these values but not add, update or delete.

#### **2.1.3.2 Members**

The following Entities are members of Level C and are configured and defined by Users at this level:

- [Level D](#)
- [Area](#)
- [Authorised Person](#)
- [Attachment](#)
- [Cable \(via Tagged Item entity\)](#)
- [Cable Type](#)
- [Digital Document](#)
- [Drawings](#)
- [Equipment Status](#)
- [Equipment Type](#)
- [Equipment Type to ITR](#)
- [Footer](#)
- [Gland Type](#)
- [ITR](#)
- [Line \(via Tagged Item entity\)](#)
- [Location](#)
- [Material](#)
- [Mechanical Joint \(via Tagged Item entity\)](#)
- [MOC](#)
- [MOC Type](#)
- [Module](#)
- [Operation Type](#)
- [Parent Tag](#)
- [Phase](#)



- Priority
- Procedure
- Procedure Section
- Procedure Step
- Profession
- Project Code
- PWL
- Q Pack
- Service Detail
- Service Interval
- Spool (via Tagged Item entity)
- System
- Subsystem
- System Group
- Tag (via Tagged Item entity)
- Test Pack (via Tagged Item entity)
- Work Group
- Work Pack Type

## 2.1.4 Level D

### 2.1.4.1 Definition

Level D is the ‘Project’ level. This represents a collection of work scopes which, when taken constitute a specific campaign or purpose to be achieved for business or operational reasons. All levels beneath this (Level E) will be able to utilise the information defined at the levels above. They will be able to select from those values but not add, update or delete them.

### 2.1.4.2 Members

The following Entities are members of Level D and are configured and defined by Users at this level:

- Level E
- Punch List Item Auto Number

## 2.1.5 Level E

### 2.1.5.1 Definition

Level E is the ‘Scope of Work’ level. This represents a further subdivision of a Project and is the level in which work packaging is defined, activity related information is populated and most tasks are performed. These can include the sign-off of Tag ITRs and Tag PWLs along with the progressing of Operations and Handovers.

### 2.1.5.2 Members

The following Entities are members of Level E and are configured and defined by Users at this level:

- Activity
- As Built Drawings



- Certification Grouping
- Digital Document Result (visible as part of Digital Document)
- Handover
- Handover Link (visible as part of Handover)
- Handover Type
- Job Card
- Operation
- Primary Handover
- Punch List
- Punch List Item
- Secondary Handover
- Sign Off Result (visible as part of Digital Document)
- Tag ITR
- Tag PWL
- Task Result (visible as part of Digital Document)
- Walk Down
- Work Pack

## 2.1.6 Example Data Organisation - Levels

### 2.1.6.1 Single Tenancy: Astro Works Space Exploration Co. (Astro Works) – Simple

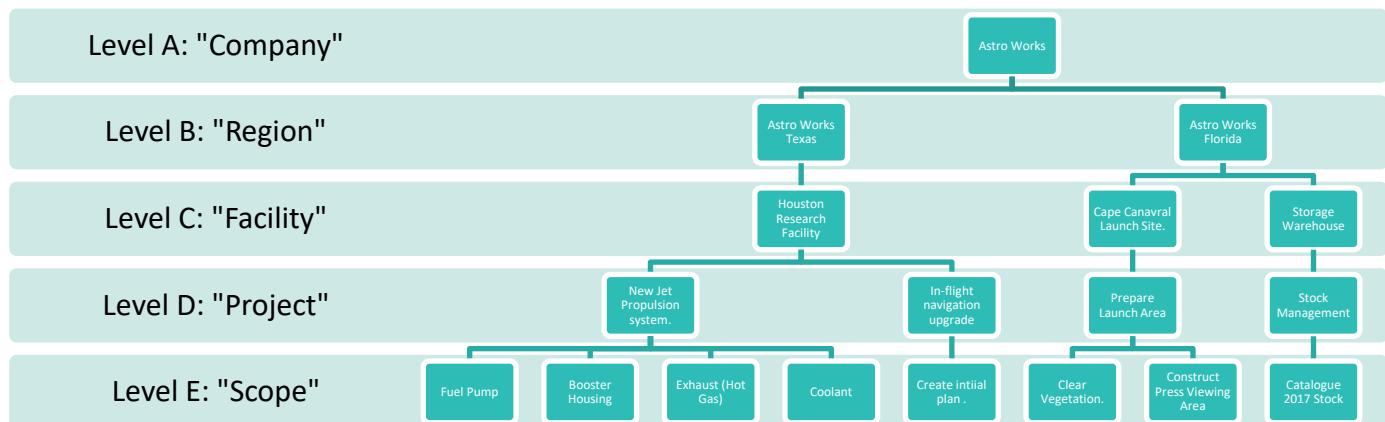


Figure 1. Example of a Region (Level B) divided set up.

The above is a simple representation of a possible instance structure within hub2, including “alias” names for each level.

### 2.1.6.2 Single Tenancy: Super Granular

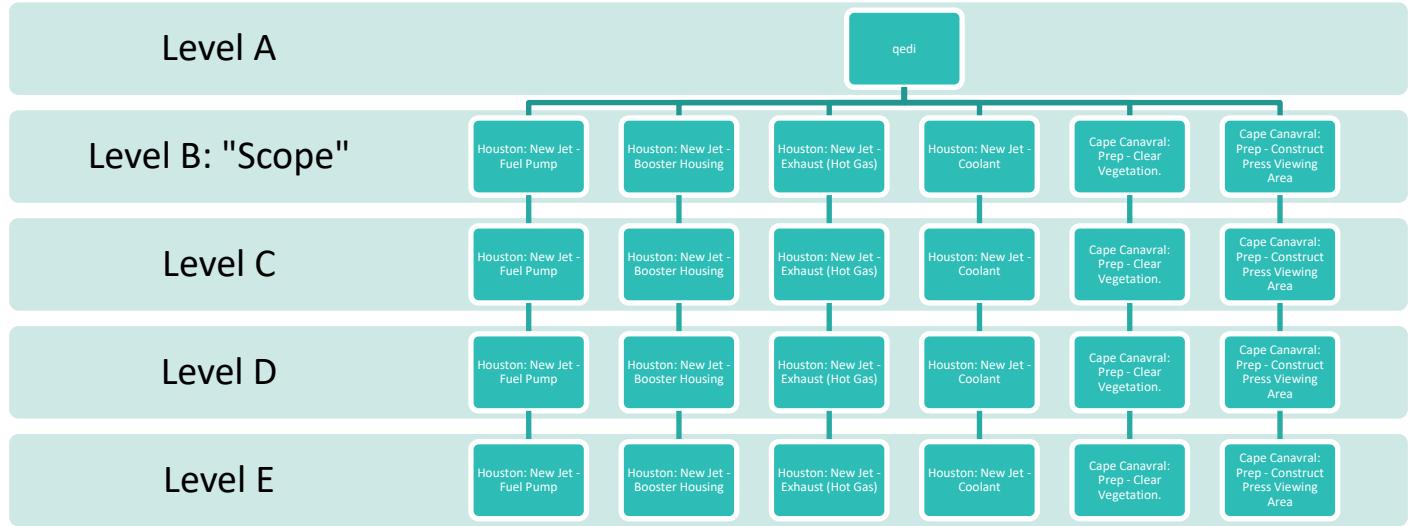


Figure 2. Example of a Super Granular level set up.

In this example, each Level exists on a one-to-one relationship. This allows each to have completely different settings, isolated from each other, while still allowing the client to control administrative access at each level. The downside is the increase in administrative work if changes are required on a wider basis, along with greatly increased chance of inconsistency between scopes.

### 2.1.7 Extended Logical Structure

It's possible to use the Level breakdown in combination with the data stored within hub2 to visualise the full organisation of information from the highest to the lowest level.

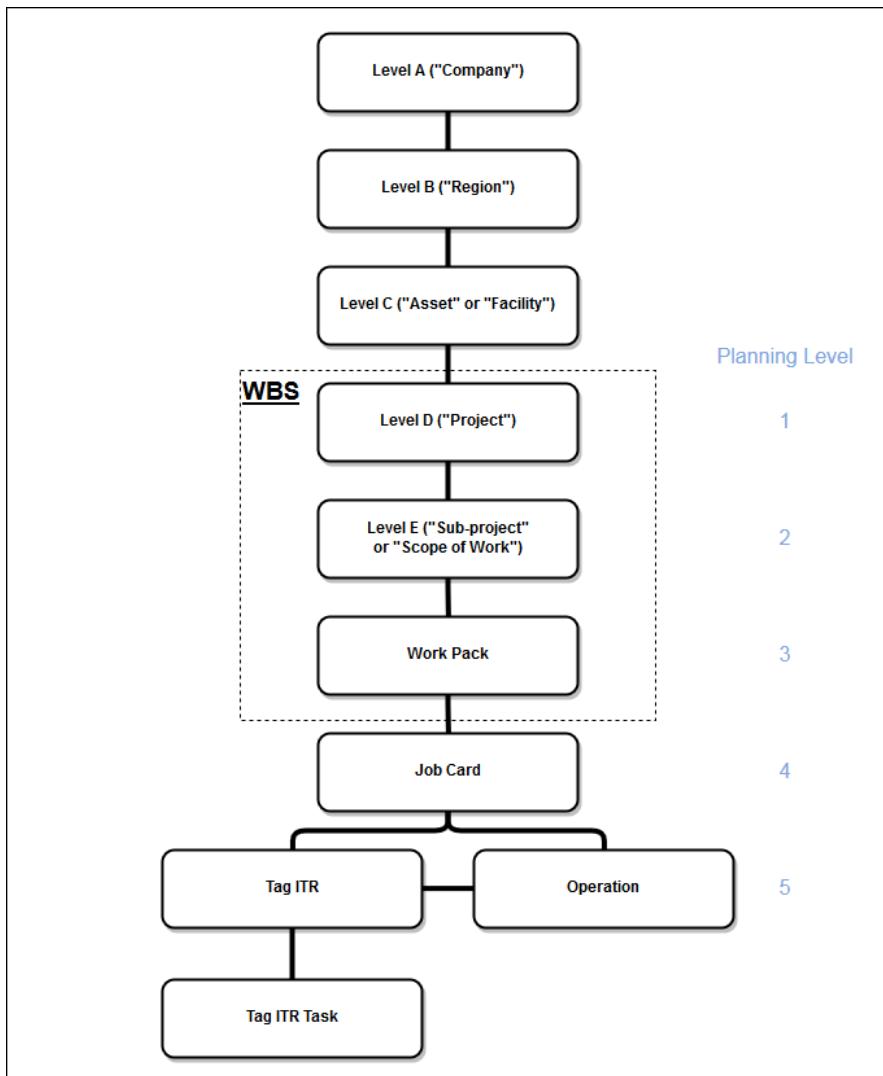


Figure 3. A diagram illustrating how elements and entities are logically arranged in hub2, including a proposed highlighting of the Work Breakdown Structure (WBS).

#### 2.1.7.1 Work Breakdown Structure

The above diagram also highlights a possible Work Breakdown Structures (WBS) that could be utilised beneath Level C (which may represent an “Asset”, “Facility” or “Campaign”).

A WBS is used to “define project deliverables and establish the structure to manage work to completion” (Project Management Institute, Inc., 2006) . The highlighting of the WBS is for example purposes only. It is possible that an actual implemented WBS may vary significantly from the proposal above.

## 2.2 Data Rules

Due to the use of REST APIs within the software, the ";" symbol cannot be used for any "Name" fields throughout hub2.

## 3 Project Administration

### 3.1 Definition

The Project Administration settings for hub2 allow us to change different settings on an instance to best match the requirements of a Project. These settings can vary from Aliasing certain fields to meet company specific terminology, removing certain section that will not be utilised by a Project or changing the logos on Reports.

### 3.2 Settings

#### 3.2.1 Aliasing

At Level A the user will be able to alias certain fields. Aliasing a field will mean the name of that field will change in all sections it's mentioned in this includes the menu bar, any search filter, on exports and imports and in any report.

The fields that can be aliased are

- Level A-E
- Primary Handover
- Secondary Handover
- Certification Grouping
- Area
- Module
- System Group
- Q Pack
- Procedure Category
- Operation
- Operation Type
- Phase
- Tag ITR: Schedule Revision
- Tag ITR: Schedule Group

##### 3.2.1.1 Editing the Aliases

Clicking Add Alias will reveal a panel where a new alias can be added. This panel uses a drop down to allow the selection of the field the user requires to alias. Once selected a textbox will be added to the main Admin section and the entry for this textbox will be used as the alias field. To delete an alias simply leave the textbox blank.

##### 1.1.1.1.2 Button and Links



UI Element	Type	Description	User Restrictions	Feature Restrictions
Save	Button	Saves the changes made by the user.	Adding or Editing Permissions	None
Save & View	Button	Saves the changes made by the user and navigates to the View page	Adding or Editing Permissions	None
Add Alias	Button	Show the alias panel	None	None
Aliases	Panel	Shows a Drop-Down menu where with fields available for aliasing. Selecting one and clicking add alias will make it available in the admin screen for aliasing	None	None

Table 5. **Buttons available on the Level A Edit page**

### 3.2.1.2 Alias Rules

The following rules and guidelines apply to any alias:

- Existing Custom Reports will not be updated when an affected Alias is changed. This is to prevent unintended disruption that occurs when report formatting is changed without notice.
- Aliases can only have letter, number or spaces. No special characters can be used.

### 3.2.2 Project Features

#### 3.2.2.1 Level C

The following Project Features are configured at Level C, they can be edited via the Level C Admin page.

Section	Description	Possible Values
Preservation Progress Method	Show the method that Preservation will be progressed by	Due Date/ Sign Off Date
Preservation Window Before	Number of days Preservation can be signed off before Due Date	Can be left blank or set to an Integer greater than 0
Preservation Window After	Number of days Preservation can be signed off after Due Date	Can be left blank or set to an Integer greater than 0
Equipment Type to ITR Rule	When Equipment Type to ITRs are automatically added	Tag Added / Equipment Type or Equipment Status Changed / Advisory Only / Off
Storage Limit	The amount of storage for attachments in MB available in the Level C	Must be set of there will be no storage for any attachments.



Certification Grouping	Determines if the Certification Grouping Reference Table is turned on or off. If the Reference Table is turned off, then the Certification Grouping fields won't appear on associated pages i.e. Tag ITRs	True or False (default: True)
Preservation	Determines if the Preservation Section will be turned on and off. Turning this off removes all Preservation pages including the Reference Tables and the grids on the Tagged Items.	True or False (default: True)
Procedures	Determines if the Procedure Sections will be turned on and off. Turning this off removes all the Procedure pages including the Reference Tables.	True or False (default: True)
Ex	Determines if the Ex Fields on Tagged Items will be turned on and off. Turning this off removes the ability to flag a Tag as Ex Rated and removes all the Ex Reference Tables	True or False (default: True)
Materials	Determines if the Material Fields on Operations will be turned on and off. Turning this off removes the ability to raise Materials against Operations and removes all the Material Reference Tables.	True or False (default: True)
Single Drawing Attachments	Determines if Drawings are restricted to single attachments only. Turning this off allows the ability to add multiple attachments to Drawings. This does not affect uploading attachments elsewhere.	True or False (default: False)

Table 6. **Level C Features**

### 3.2.2.2

The Add/Edit page for Level E will contain the following Project Features that can be configured as per the table below

Section	Description
Punch Lists	Shows if the Punch List is One Tier or Two-Tier Punch Lists
Time Zone	Shows the Time Zone of the current scope
Handovers	Table of the current enabled Handovers
Enable Handovers	Turns on or off the functionality for Primary and Secondary Handovers. Turning this off will remove the Primary and Secondary Handover

	Reference Tables and remove the ability to associate Tag ITRs, MOCs and As Built Drawings with Primary and Secondary Handovers.
--	---

Table 7. **Details of the Features listed for Level E**

### 3.2.3 Digital Document Footer

Footers can be configured for each Level C to be used when generating Digital Documents. The different options for the configuration can be edited and viewed on the following screens, accessible via the Level C Admin View screen.

#### 3.2.3.1 Footer View

The View page for Footer will contain read only details for the Footer. Text fields for each of the Left, Centre, and Right elements of a footer will only be displayed if Footer Type of each element is of type Text. There will be buttons to Edit and view the History of the footer.

#### 3.2.3.2 Footer Add/Edit

The Add Edit page for Footer will contain fields for Left, Centre and Right elements of a Footer. A type can be selected for each of these from the following options: Text, Page Number, Revision, and Generated Date. If the type Text is chosen then an additional text input will be displayed for the user to enter the text to be output on Digital Documents.

### 3.2.4 Project Logos

On the View page for Level D there is the ability to change the logos for Reports and Documents produced from the application and contains a button which links to the Punch List Auto Numbering if this feature is turned on.

#### 3.2.4.1 Editing Logos

The Left Image and Right Image both have an “Add” button to allow an image to be uploaded that will appear on the top left corner of reports or documents produced from hub2. If an image already exists the add button will replace the existing image.

### 3.2.5 Auto Punch List Number

The Auto Punch List Number page will allow the user to edit the schema used to generate new Punch List Numbers. All Punch List Item Numbers will use a sequential number. The format of this number is configurable via the page.

It will be possible to change this character length at any time, but if Punch List Items already exist, it will not be possible to change the length in such a way that it would make the maximum number lower than an existing Punch List Item number – e.g. if a Punch List Item with Number 10000 exists, it will not be possible to make the length 4.

#### 3.2.5.1.1 Listing of fields / clarification of details on page

Field	Type	Description
Prefix	Textbox	Allows the Prefix to all Punch List Item Numbers to be set.

Suffix	Textbox	Allows the Suffix to all Punch List Item Numbers to be set.
Number Length	Textbox	Sets the length of the numerical characters in the Punch List Item Number to be set.
Enforcement	Drop Down	<ul style="list-style-type: none"> <li>• <b>Strict</b> – the generated auto-number <i>must</i> be used for the Punch List Item number</li> <li>• <b>Format Only</b> – the user can choose their own number rather than the generated auto-number, but it must still comply to the auto-number format specified in the new admin page</li> <li>• <b>None</b> – there is no enforcement at all, so the auto-number feature is being used only to generate suggested Punch List Item numbers.</li> </ul>
Schema	Label	Example of what a generated auto-number would look like under the proposed schema, to ensure it matches the user's expectations. This will update when the Prefix, Suffix and Number Length text boxes change.

Table 8. **Punch List Auto Number UI listing.**

### 3.2.6 Handover Types

On the Level E View page, it is possible to configure the Handover Types as per the Handover section.

## 3.3 Validation & Business Rules

### 3.3.1 All

All Levels may be disabled. This will prevent all access.

The user permissions of a disabled Level can still be changed via qedID.

### 3.3.2 Level B-E

Once the Level has been created its parent level cannot be changed i.e. Once a Level C has been raised its Level B cannot be changed

### 3.3.3 Level E

The Time Zone selected effects all the rules that prevent early signoff. When there is a rule that an item cannot be signed off before today this will depend on the Level E's Time Zone. The Date in the selected time zone will be used to work out the last possible signoff date.



## 4 Logging In

### 4.1 Definition

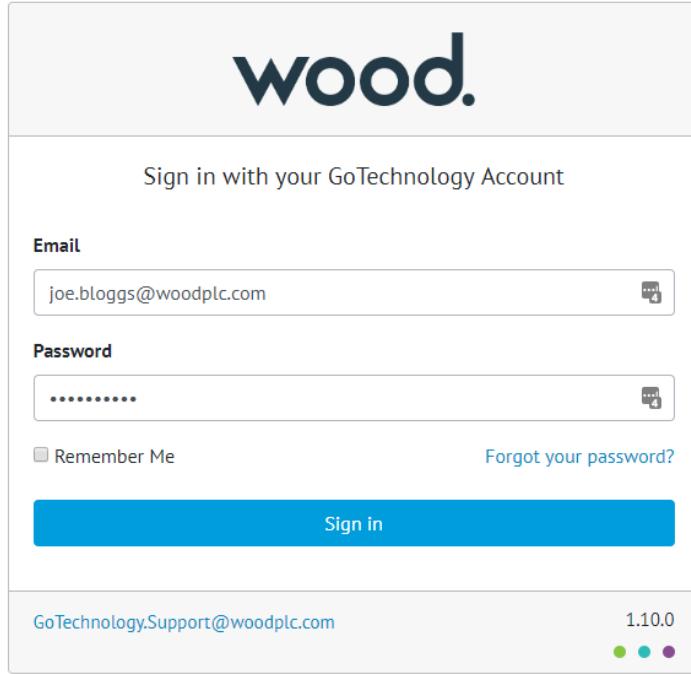
qedID is the Authorisation and Authorisation service which will manage access to hub2. Full details of qedID is available in the qedID specification. This section will deal with the logging in via qedID from hub2.

### 4.2 Pages

To access any page in hub2 the user must login via qedID.

The user sign in process of qedID will consist of a form with fields for Email and Password, and a “Sign In” button. In addition, a “Remember Me” checkbox will allow the user to avoid re-entering their email address in future when using the same browser. Clicking the “Sign In” button starts an authentication request to the server passing the specified email and password.

The contents of the email field will be case insensitive, e.g. `jsmith@acme.com` and `JSmith@ACME.com` will refer to the same user, however the case of values entered in the password field must match exactly.



The screenshot shows a login page for 'wood.' with the following elements:

- Header:** The word "wood." in a large, dark blue sans-serif font.
- Section Header:** "Sign in with your GoTechnology Account" in a smaller, dark blue font.
- Email Input:** A text input field containing "joe.bloggs@woodplc.com". To the right of the input is a small icon showing a person with a checkmark.
- Password Input:** A text input field containing a series of dots ("....."). To the right of the input is a small icon showing a person with a checkmark.
- Remember Me:** A checkbox labeled "Remember Me" followed by a link "Forgot your password?"
- Sign In Button:** A large, blue rectangular button with the text "Sign in" in white.
- Footer:** At the bottom left is an email address "GoTechnology.Support@woodplc.com". At the bottom right is the version number "1.10.0" and three small colored circles (green, teal, purple).

Figure 4. Login page

#### 4.2.1 Starting points for Authentication

Since authentication for multiple web applications will be handled in a centralised location, this allows for flexibility in the endpoint to which users initially access the instances supported by qedID. Users will be able to navigate directly to the endpoint `https://id.qedi.co.uk` to sign in, or one of the supported instances such as `https://uk.qedi.co.uk/MyInstance`.

In the latter case, the user will be redirected to qedID for sign in, and then automatically redirected back to the instance from which they started. This redirect functionality works equally well for deep links within an instance, for example where a user has been sent a URL, or has bookmarked a specific page or search within an instance.

When signing in directly to qedID without starting from a specific instance the user will be shown a list of application instances to which they have access. If the user only has access to a single instance, then the page will not be displayed and instead they will be automatically redirected to that instance. In this way, qedID acts as a portal to supported applications.

#### 4.2.2 Authentication Token Expiry

The token obtained from qedID during authentication will last for 20 minutes until it must be refreshed. The process of refreshing the token will be automatic and largely transparent to most users, since qedID will maintain a Single Sign-On session which lasts for a much longer length of time. For further information about this process and Single Sign-On, consult the specifications for qedID and OpenID Connect.

### 4.3 Session

In addition to the authentication token, each user will have a ‘Session’ which persists user-selected preferences between web requests to the application. The only item currently stored within the Session is the current Level Selection (see Section 8), which defines the organisational context for which data in *hub2* should be queried and stored. The Session will be persisted using a unique identifier stored in a cookie, and the data will expire after 10 hours of inactivity.



## 5 User Permissions

User Permissions in hub2 are controlled directly by qedID. Users can have access to various Levels with read-only or write access depending on the permissions assigned.

### 5.1 Permissions

Each Permission allows the user access to one specific area of hub2, users will not be assigned permissions directly but instead will be assigned roles, which are a group of permissions.

The standard permissions are Create, Read, Update and Delete. Read allows the user read-only-access to a section, thus allows them to see the data but not change it, a user must have read access before they can be assigned any further roles in that area. Create allows the user to add an item to that section, update allows the user to update an existing item and delete allows the user to delete an existing item.

Most sections also have an Excel Import and to use this functionality an Import permission is required. A user can have import access to specific sections, meaning that they will be able use the import section but only for the specific tables they have the Import permission for. Not all sections have Import permissions due to there not being an Import available for that section

The following table shows permissions which don't have the standard Create, Read, Update, Delete and Import Permissions, or have additional permission beyond the standard permissions. Section which have Sign off or Assign Permissions means a user can go in and only Sign Off the item but make no further changes to it, both of these permissions include a "Self Sign Off" which only allows the user to sign off as their own account.

Section	Standard Permissions	Sign Off	Assign	Details
Assurance Tracker	All	Yes	No	
Attachment	No Import	No	No	Upload Attachments – Ability to upload an Attachment against any section that has attachments.
Custom Field	Read and Update Only	No	No	
Digital Document Check Box Type	No Import	No	No	
Footer	No Import	No	No	
Handover	All	Yes	No	Generate DOCX Documents (2) Digital Document Result Permissions (4)
Handover Type	All	No	No	Upload DOTX Templates (1) Digital Document Template Permissions (3) Cover Sheet Permissions (5)
Import Result	Read Only	X	X	
ITR	All	No	No	Upload DOTX Templates (1) Digital Document Template Permissions (3)
Job Card	All	Yes	Yes	
Level A- E	No Import	No	No	
MOC	All	Yes	No	Generate DOCX Documents (2)
MOC Type	All	No	No	Upload DOTX Templates (1)



Section	Standard Permissions	Sign Off	Assignment	Details
Procedure	All	Yes	Yes	
Procedure Section	All	Yes	No	
Procedure Step	All	Yes	No	
Procedure Type	All	No	No	
Punch List Item	All	Yes	Yes	
PWL	All	No	No	Upload DOTX Templates (1) Digital Document Template Permissions (3)
Scheduled Report	No Import	No	No	
Tag ITR	All	Yes	Yes	Generate DOCX Documents (2) Digital Document Result Permissions (4)
Tag PWL	All	Yes	Yes	Generate DOCX Documents (2) Digital Document Result Permissions (4)
Tracker Type	All	No	No	Digital Document Template Permissions (3)
Work Pack	All	Yes	Yes	Digital Document Result Permissions (4)
Work Pack Type	All	No	No	Digital Document Template Permissions (3) Cover Sheet Permissions (5)
Work Pack Approvals	No Import	Yes	No	
(1) = Ability to Upload a Bookmarked DOTX Template which will be used when Generating documents (2) = Ability to Generate a specific DOCX Document based on the Bookmarked Template (3) = Ability to Edit a Digital Document Template which is an electronic form that will be completed on screen, via the mobile app or on a smart PDF (4) = Ability to Complete the Digital Document Template on screen, in PDF or via the Mobile App.				

Table 9. Full List of Permissions available in hub2

## 5.2 Roles

Roles are made up of groups of permissions, a user can have one or more roles assigned to them. Roles can be created using qedID via the existing list of permissions listed above. For a more detailed definition of roles please see Section 5.1 of the qedID Specification.

## 5.3 Permission Denied page

If the user clicks on a page which they do not have permission to view, they will be taken to the permission denied page. This page will state to the user that they cannot perform the action due to lack of permission and allow them to return to the previous page or navigate using the normal menu bar.

## 5.4 Permission Denied Message

If the user clicks on a button which performs an action that they don't have permission to perform but this action would normally take place on the same page i.e. Delete, Upload. They will be shown a permission denied error message in the same format as a normal error message.



## 6 GUI Overview

### 6.1 Font

#### 6.1.1 Intended font and fall-back options.

The default font for hub2 is Montserrat. This is the font suggested in the Wood brand guidelines for online materials. If this font cannot be loaded the fall-back option will be a “Sans Serif” font that is installed on the user’s machine.

The exact fall-back font will vary depending on the user’s configuration and browser, it will most likely be either Arial or Helvetica and so those are provided for comparison below.

Font	Usage		Pangram
Montserrat	Default	<p>Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam tristique purus eu ipsum congue pharetra sed ut tellus. Cras id magna at odio cursus aliquam placerat sit amet sapien. Ut dictum rutrum ante.</p>	The quick brown fox jumps over the lazy dog.
Arial	Possible fall-back	<p>Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam tristique purus eu ipsum congue pharetra sed ut tellus. Cras id magna at odio cursus aliquam placerat sit amet sapien. Ut dictum rutrum ante.</p>	The quick brown fox jumps over the lazy dog.
Helvetica	Possible fall-back	<p>Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam tristique purus eu ipsum congue pharetra sed ut tellus. Cras id magna at odio cursus aliquam placerat sit amet sapien. Ut dictum rutrum ante.</p>	The quick brown fox jumps over the lazy dog.

Table 10. **Font listing and comparison for hub2.**

### 6.2 Colours & Themes

It is intended that hub2 will support multiple colour themes. Each theme is based on core colours. The theme can be changed from the Theme panel on the User Settings screen (this is accessible from the User Menu).

#### 6.2.1 Reserved Colours

Certain colours are reserved for use in communicating specific information. These colours are used throughout the application both on screen and in alerts or notifications. For example:

- Green is used to indicate success, for example, an expected result or work that is fully completed
- Amber is used to represent cautionary messages, for example, alerts for a missing template or matrix that will not prevent the user proceeding
- Red is used to demonstrate an unexpected result or outstanding or overdue work



## 6.2.2 Theme Elements

### 6.2.2.1 Theme Colour Components

#### 6.2.2.1.1 Body Background

The main background colour of the page in hub2. The sheet colour matches the background colour.

#### 6.2.2.1.2 Card Colour

The card colour in hub2. Cards are used to distinguish different elements (cards) on the page.

#### 6.2.2.1.3 Primary Colour

The primary “highlight” colour used for card headers and primary UI elements throughout the application.

#### 6.2.2.1.4 Secondary Colour

The secondary “highlight” colour. This contrasts with the primary colour and is used for alternative buttons (displayed on a primary background) and selections.

## 6.2.3 Themes

### 6.2.3.1 Default (Light)

#### 6.2.3.1.1 Colours

Name	Light Hex	Light RGB
Background	#FFFFFF	rgb(255,255,255)
Sheet	#EEEEEE	rgb(238,238,238)
Primary	#2DBDB6	rgb(45,189,182)
Secondary	#AEE2EO	rgb(174,226,224)
Success	#00A0AF	rgb(0,160,175)

Table 11. Light Theme Colours

#### 6.2.3.2 Dark

Dark themes provide high contrast between text and background. To maintain the contrast, headers in the dark theme are the same colour as the cards or sheet. Minimal highlighting is provided using the primary, secondary and reserved colours to distinguish key information.

#### 6.2.3.2.1 Colours

Name	Dark Hex	Dark RGB
Background	#292929	rgb(41,41,41)
Sheet	#121212	rgb(18,18,18)
Primary	#AEE2EO	rgb(174,226,224)
Secondary	#2DBDB6	rgb(45,189,182)
Success	#00A0AF	rgb(0,160,175)



Table 12. Dark Theme Colours

## 6.3 Page Titles

### 6.3.1 Entity Pages

For the standard View, Edit, Add, and Search pages of Entities, the title format will be as below:

Page Type	Title Format	Example 1	Example 2	Example 3
View/Edit/Add	[Entity Name or abbreviated Entity Name]: [Identifier]	Tag: 01-TP-003	Tag ITR: 01-TP-003 - QED-A06A	Skeleton: GD-SKEL
Search	[Entity Name] Search	Tag Search	Tag ITR Search	Procedure Skeleton Search
History	Name: [Entity Name]	Name: 01-TP-003	Name: 01-TP-003 – QED-A06A	Name: GD-SKEL

Table 13. Description of Entity Page titles

### 6.3.2 Other pages

Page	Title	Example
Imports > Imports	Imports	-
Imports > Import Templates	Import Templates	-
Imports > Import Logs	Import Logs	-
Import > Import Digital Documents		-
Planning > Work Packs > [Edit Work Pack] Approval	Approval: [Work Pack Entity Name] – Round [Round Identifier] – [Approval Entity Name]	Approval: AL01-00003 – Round 1 – Plumbing
Preservation > Look Ahead	Preservation Look Ahead	
Documents > Attachments > Add	Upload Attachments	
Documents > Upload Digital Documents	Upload Digital Documents	
Documents > Upload Barcoded Documents	Barcode Document Upload	
Documents > Documents	Lookup Document Codes	
Report > Report List		

Report > Report List > [Report Code] - [Report Name]	[Report Name]	Job Card Detailed Report
Report > Create New Detailed Report	Create Detailed Report	
Report > Create New Summary Report	Create Summary Report	
Report > Planned Vs Actual Progress	[Report Name] Progress	MCC Planned Start vs Actual Finish Date Progress
Report > Skyline	[Report Name] Skyline	PCSAC Skyline
Report > Scheduled Reports	Scheduled Report Result	
Admin > Saved Searches	Saved Searches	
Admin > Setup Scheduled Reports	Scheduled Report	
[User Name Menu] > User Settings	User Settings	

Table 14. **Description of Other Page Titles**

## 6.4 On Screen Alert Messages

### 6.4.1 Notification Alert Messages

Alert messages, also known as ‘toasts’, appear at the top right corner of the page for five seconds and are used to provide feedback on actions such as saving, deleting or signing off an item. Toast alert messages can be disabled in the “user settings” (see Notifications), they are enabled for all users by default.

A successful alert appears in green with a tick glyphicon next to it.

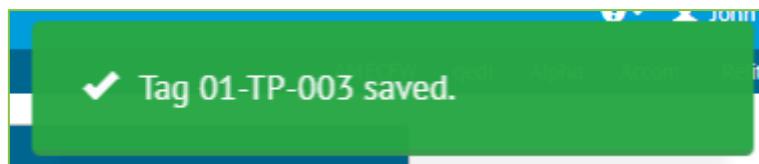


Figure 5. **Success Alert Message**

A warning alert appears in red with a warning triangle next to it.

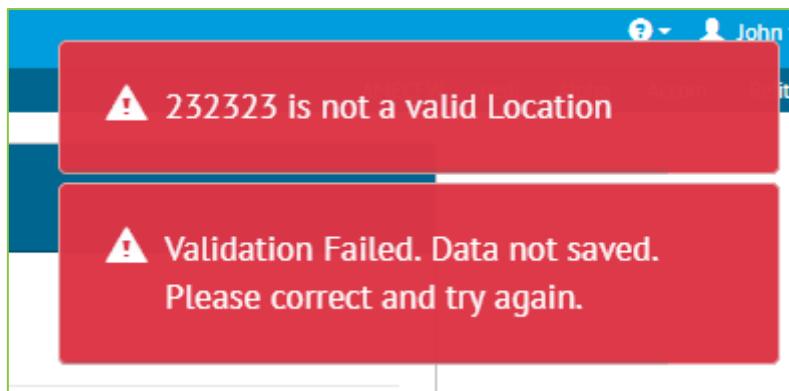


Figure 6. Failure Alert Message

#### 6.4.2 Loading Messages

These messages appear in the bottom right of the screen when content is loading.

#### 6.5 Error page

When an unexpected error occurs with the application or the user navigates to a page which provides very basic details on the issue is displayed.

The content of the page varies according to the nature of the error (as defined by the HTTP Status Code<sup>1</sup>, which indicates the server response to a client request) with the possible options described in the table below. Only errors from within hub2 result in a custom error page, and server errors which occur earlier in the HTTP pipeline are not customised. For example, if hub2 has stopped responding to requests, IIS (Internet Information Services) might return a default 502 or 503 error page.

Error Code	Error Name	Description
400	Bad Request	The request could not be understood
401	Unauthorised	The request requires user authentication
403	Forbidden	The request could not be fulfilled
404	Not Found	The page you were looking for could not be found
408	Request Timeout	The server timed out waiting for the request
500	Internal Server Error	The server encountered an unexpected condition which prevented it from fulfilling the request.
502	Bad Gateway	The server, while acting as a gateway or proxy, received an invalid response from the upstream server it accessed in attempting to fulfil the request
503	Service Unavailable	The server is currently unable to handle the request

Table 15. Error Message given by hub2 based on Error Codes

<sup>1</sup> List of HTTP Status Codes: <https://www.w3.org/Protocols/rfc2616/rfc2616-sec10.html>

## 7 Level Select

### 7.1 Definition

The Level Select functionality allows the user to choose which Level E and subsequent parent Level D, Level C, Level B, and Level A, they are working in. This impacts which data is shown and accessible in the Search pages, Reports, and all other areas of the application.

Prior to selecting a Level E only a subset of functionality is available in the Menu Bar. These menu options are Admin, Help and User Account. Once the user has selected a Level E the full applicable Menu Bar is loaded.

If the user has set the “Remember Last Level” setting on the “User Settings” page, then the Level Select screen will be skipped when logging in to the hub2 instance.

### 7.2 Pages

#### 7.2.1 Level Select

The Level Select page displays all the levels a user has permission to access in a selectable list, showing both the Level’s Name and Description, starting from Level A navigating down to Level E. A breadcrumb widget displays the Levels the user has selected. Each time a selection is made, the Level Name is added to the breadcrumb trail, and the selectable list is updated with the child Level options.

If there is only one Level option available, the breadcrumb trail is automatically updated with the Level Name, and the selectable list is updated with the next set of child Level options.

Once a Level E has been selected the user is directed to the hub2 Home page, or if they were attempting to navigate to a different page within hub2, but needed to select a Level E first, then they are redirected to their original target URL.

#### 7.2.2 Level E Menu Picker

When the user has chosen a Level E the menu bar updates to show all the currently selected Level Names in the form of a breadcrumb widget. Each Level Name from A through D is a hyperlink, which directs the user back to the “Level Select” page.

The Level E Name also displays a drop-down menu, which expands to display all the available Level E Names which are children of the currently selected Level D. Using this drop-down menu, if the user has the correct permission, they can change to the Level E without navigating to the Level Select page. If the user wishes to switch to a different Level D or above, the breadcrumb links can be used to return to the Level Select page.



## 8 Home Screen

### 8.1 Overview

The Home Screen appears whenever the user selects a Level E from the Level Select screen. The screen shows 6 charts and is intended to provide an overview of the Level E the user has selected.



Figure 7. Home Screen Layout

### 8.2 Details

The 6 charts are described in each section below. The charts will be shown with two per row unless the screen size is too small then they will be shown one per row. Each of these can be downloaded in pdf format by using the Download button beside the chart title.

The arc charts will display a maximum of 6 items in each group on the Home Screen, however, the pdf download includes all of the available charts. For example, the Handovers chart will only show the arc charts for up to six Handover Types on the Home Screen but the downloaded file will contain the arc charts for all Handover Types. The charts appear in the same format as on the Home Screen, the downloaded file will also include a title consisting of the chart name and project and a footer containing the date and page number.

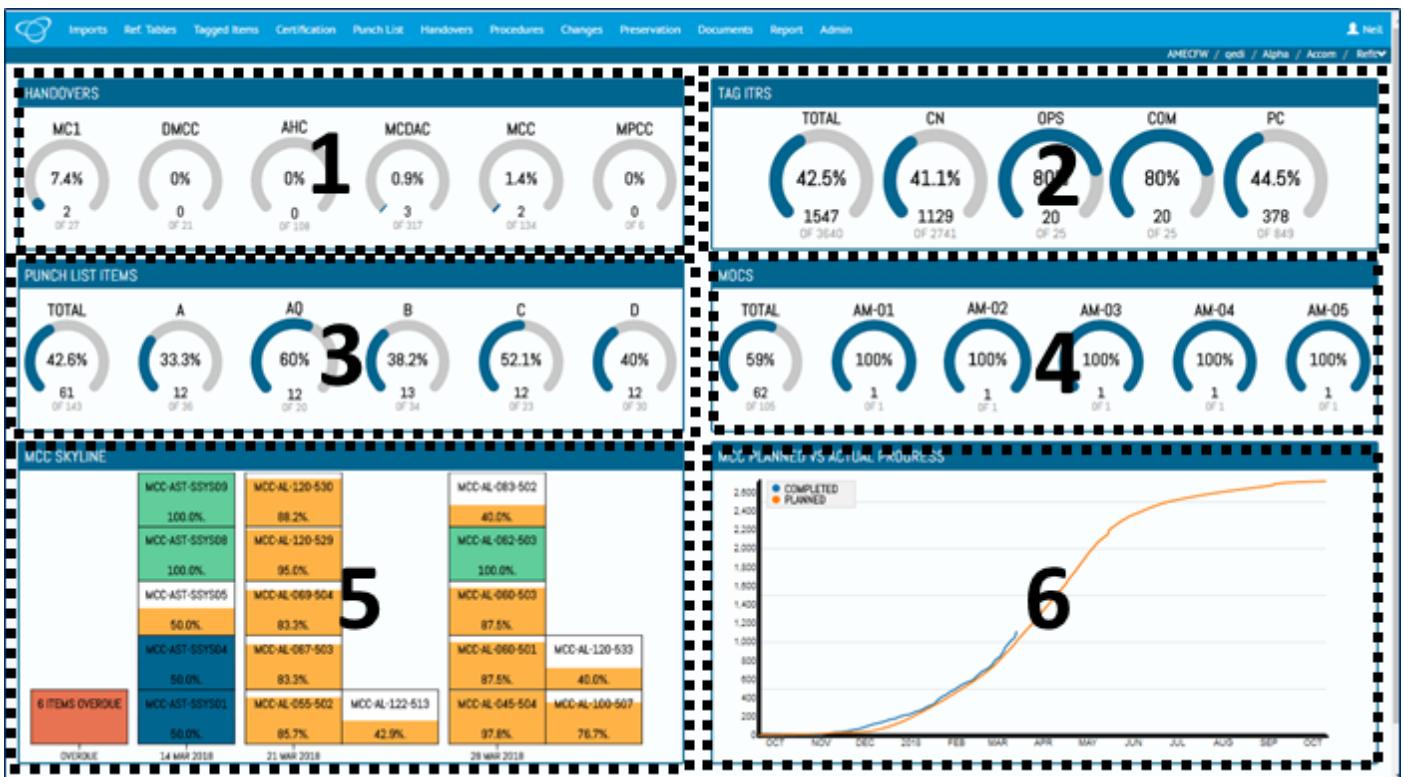


Figure 8. Screenshot showing where each chart will be displayed on the Home Screen by Number

- Chart 1 – Handover
- Chart 2 – Tag ITRs
- Chart 3 – Punch List Items
- Chart 4 – MOCs
- Chart 5 – Skyline
- Chart 6 – Planned Vs Actual

### 8.2.1 Handovers

A group containing a Progress Chart for each Handover Type (up to a maximum of six and excluding any Handover which will be solitary by nature, such as Handovers grouped by Level E, as these will be either complete or incomplete)

### 8.2.2 Tag ITRs

A group containing a Progress Chart showing the percentage of ITRs complete (i.e. the Signed Off Date and Signed Off By fields are both populated) within the following groups:

- a. The total ITRs within the Level E.
- b. Up to five ITR Classes within the Level E. If more than five ITR Classes exist, then only the first five (by Handover Gate, then alphabetically) will be displayed.

### 8.2.3 Punch List Items

A group containing a Progress Chart showing the percentage of Punch List Items accepted (Accepted Date and Accepted By fields are both populated) within the following groups:

- a. The total Punch List Items within the Level E.
- b. Up to five Punch List Item Categories within the Level E. If more than five Punch List Item Categories exist, then only the first five (alphabetically) will be displayed.

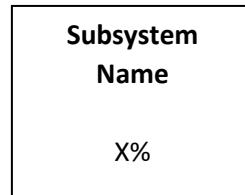
#### 8.2.4 MOCs

A group containing a Progress Chart showing the percentage of MOCs closed (Closed Date and Closed By fields are both populated) within the following groups:

- a. The total MOCs within the Level E.
- b. Up to five MOCs within the Level E. If more than five MOCs exist, then only the first five (alphabetically) will be displayed.

#### 8.2.5 Skyline

Within a Skyline Report each planned item (in this case Subsystem) is given a square box containing information on the items progress.



These boxes are stacked vertically for each planned date, with the dates themselves extending along the horizontal axis.

As each item is progressed the colour of the box changes to show the progress.

The Skyline shown depends on the Handover Type selected to display on the Home Screen, the chart is selected by choosing the “Show on Front Page” setting associated with a Handover Type. Only Handovers with a Planned Finish Date are included in the charts.

Only overdue items and the next few weeks of information are shown on the Skyline. The exact number of items displayed depends on many factors including screen size, the number of items due and the number of items overdue. Any complete Handover that occurred in the past, are hidden, unless they share a date with a Handover that is still due. If there are multiple dates on the overdue Handovers then they are combined into one box of overdue items.

**Further information on the Skyline is provided in the Report Section of this document.**

#### 8.2.6 Planned vs Actual

The ITR Planned vs Actual is a line chart that shows two lines:

- a. Planned:
  - Calculated for each Handover Type by:
    - i. Taking the number of days between the earliest Planned Start Date or Sign Off Date and latest Planned Finish Date or Sign Off Date
    - ii. Evenly distributing the total ITRs required (if the Planned Start Date or the Planned Finish Date is not populated the ITRs will not be included)
    - iii. Repeating for the next Handover Type (until there are no more remaining)

iv. Aggregating the results

- b. Completed: The number of Tag ITRs completed on a given day.

The Planned Vs Actual chart shown depends on the Handover Type selected to be shown on the Home Screen, the chart chosen is selected using the “Show on Front Page” setting associated with a Handover Type. Only Handovers with a Planned Start Date and Planned End Date are included in the chart.

Hovering over a point on the Planned vs Actual chart shows the date and the number of ITRs planned or completed.

#### 8.2.6.1 Download

The pdf download for the Planned vs Actual chart includes the line chart, as displayed on the Home Screen, and a table that represents the data points shown on screen. The date range on the x-axis is adjusted based on the number of data points. For example, the date range would be in weeks for data spanning a period of 9 weeks, in months for data over 157 weeks or days for a shorter period.

The columns in the Planned vs Actual table are described in the table below.

Columns	Description
Planned	The average number of planned ITRs for the date range.
Completed	The number of completed ITRs for the date range.
Accumulative Planned	The total of the average planned ITRs until the last date in the date range.
Accumulative Completed	The total of completed ITRs until the last date in the date range.

The user has three options, Daily, Weekly or Monthly, to select the date range grouping in the downloaded report table. These options are accessed using the arrow to the right of the Download button. If the user chooses an option using one of these options, the table report is grouped based on it. This selection does not change the graphical chart. If the user chooses no option, the grouping on the table report would be decided by the system based on the size of data.

## 9 Standard Search

### 9.1 Definition

The Standard Search page is used throughout hub2 for locating and filtering data. These pages use the same basic layout throughout the different sections of hub2, with the available search fields being relevant to the current selected section.

### 9.2 Pages

#### 9.2.1 Standard Search page

##### 9.2.1.1 GUI

	Name	Description	Discipline	Sub System(s)	Tag ITR(s)
<input type="checkbox"/>	088-XS-1227-J	Intertrip from JRP Request to Start ALPHA Firepump	E	AL-045-501	QED-I02B
<input type="checkbox"/>	088-XF-1227-N	Intertrip from JRP Request to Start ALPHA Firepump	F	AL-045-504	QED-I02B

Figure 9. Screenshot of the Tag Search page

##### 9.2.1.2 Overview of functionality / details of usage & workflow

An Add Filters pane is located at the top of each search page, which, when expanded, displays a list of all available filters. Selecting criteria for a filter adds it to the top of the page; clicking on a selected filter removes it.

The search results are displayed underneath the filters. Initially the results are unfiltered, until any selected search filters are applied.

##### 9.2.1.2.1 Search Fields

Each search page allows for filtering of the selected entity type by displaying a filter relating to each attribute of the entity. For example, the Tag entity includes Name, Description and Discipline attributes (amongst others) so the available filters will include those three terms.

The first attributes available at the top of each search page should be the required fields for that entity, starting with Name and Description (if applicable). Any date-related attributes (such as Created Date) always appear last on the list of filters.

Attributes which include another entity, such as a Discipline on a Tag, are selected by a lookup popup. These are opened by clicking a button next to the associated field and display a list of all available values in that entity. Selecting a value adds it to the search as a filter.

#### 9.2.1.2.2 *Search Field Grouping*

Searchable attributes can be grouped into sections. For example, the filters on the Tag ITR screen include a group of filters relating to the Tagged Item and a group relating to the ITR, amongst other groups. Any grouped attributes will be initially hidden and will become visible once the group title is clicked.

#### 9.2.1.2.3 *Recent Searches*

The last five performed searches will be stored and can be accessed from the Recent drop down on the search page. When the Search button is clicked, the criteria from the current search is added to the Recent list, unless no specific fields have been selected. Searches are listed in chronological order with the most recent search at the top.

#### 9.2.1.2.4 *Saved Searches*

A search can be saved for future use by the current user. Clicking the Save Search button opens a field for a name to be entered to identify the search. The name must be unique across all sections, and the search can't be shared with other user accounts. Searches with no specified criteria can't be saved, nor can searches that have the same criteria as an existing saved search. Saved searches are listed on the Saved Search drop down in alphabetical order.

Any search which would result in a URL longer than 2000 characters displays a warning message that the search cannot be saved. This limit applies to both Saved and Recent searches.

#### 9.2.1.2.5 *Search Types*

The type of search performed on certain filters varies dependant on its type:

- Date filters have a selectable range and the search will be performed between these two dates. If one or the other is not completed the search will look for all dates before or after the set date.
- Text filters, including those with a Lookup popup (Q), vary depending on the use of commas. If a comma is entered as part of the value then a Exact/List Match Search is used, otherwise a Contains search is used instead. Both are detailed below.

#### 9.2.1.2.6 *Contains Search*

The Contains search locates all the items currently in stored in hub2 that contain the entered text. It is the standard search performed when no comma is present in the search field. This search does not work for fields which are dates or integers.

#### Example



If the user searches for Tag Number '001' all Tag Numbers containing 001 will be found.

Tag Number	Found
Tag-1001	Yes
Tag-1101	No
Tag-1601	No
Tag-2001	Yes

Table 16. Search Results for a Search by Tag Number '001'

#### 9.2.1.2.7 Exact Match/List Search

The Exact Match/List search locates all the items currently in stored in hub2 that contain values that match any in the comma separated list. This search will be run if any commas are present in the search field.

##### Example

If the user searches for Tag Number 'Tag-1001, Tag-1101' all Tag Numbers that have either of the exact names Tag-1001 or Tag-1101.

Tag Number	Found
Tag-1001	Yes
Tag-1101	Yes
Tag-1601	No
Tag-2001	No

Table 17. Search Results for a Search by Tag Number 'Tag-1001, Tag-1101'

#### 9.2.1.2.8 Search Results

The Search Results will be displayed in pages with 20 items being shown on each page by default, however the page size can be changed to any number between 10 and 100. The user can skip to a certain page and move forward and backwards between each page in order.

Results will be sorted by Name by default. Each search result will have a link on the Name to allow the user to go to the View page of the item. Other items may have links; for example, the Discipline on a Tag. This will serve as a link to the Discipline View page for the item selected.

There will also be a checkbox to control which items are Exported and Deleted when the appropriate button is pressed.

Searches that are over 3500 characters cannot be performed due to the internal Query String Limit. Users performing these searches will get a message explaining the search was not performed.

For some entities a list will be displayed of sub-entities against their parent within a search results grid. For example, when searching Tags, a user may wish to see the list of associated Subsystems alongside the other properties of a Tag such as Name, or Discipline in the results.



Result Fields which represent a collection will be pre-configured to display the items in the collection in one of three formats: CSV, Count, or Status. Details of when these will be available will be detailed in the various sections below.

#### 9.2.1.2.9 *CSV (Comma Separated Values)*

This format lists the names of every item in the collection with each name separated from the next by a comma. For example, a list of Subsystems might be represented as:

AL-045-501, AL-045-502, AL-045-503

#### 9.2.1.2.10 *Count*

This format does not display the name of each item in the collection, and instead simply shows an integer value representing the number of items in the collection.

#### 9.2.1.2.11 *Status*

This format is similar to CSV above, except that each value is highlighted on page to show the completion status of the item. The field which indicates the completion of each item is pre-configured appropriately for each field to which this applies. For example, a list of Tag ITRs belonging to a Tag might be represented as:

**QED-P01A, QED-M27A, QED-T20A, QED-E24B**

In this example, the ITRs QED-M27A and QED-T20A are incomplete so are highlighted in bold.

#### 9.2.1.3 *Listing of fields / clarification of details on page*

##### 9.2.1.3.1 *Button Listings*

UI Element	Type	Description	User Restrictions	Feature Restrictions
Search	Button	Searches all the items by the current search filters	Read Permissions	None
Clear	Button	Clears all the search filters.	None	None
Add	Button	Loads a form for adding a new item	Adding Permissions	None
Recent Searches	Drop Down	Last 5 Searches are available in this drop down. Selecting a search will fill in the search form.  The Drop Down will show the most recent search at the Top and will show the searches in the same format as the Quick Search Bar.	None	None
Saved Searches	Drop Down	Saved Searches are available in this drop down. Selecting a search will fill in the form	None	None

UI Element	Type	Description	User Restrictions	Feature Restrictions
Save Search	Button	Saves the search currently present in the search form	None	None
Export	Button	Exports all the Results or the selected results in any are selected	Read Permissions	None
Export – Select Column	Drop Down Button (under Export)	Exports all the Results or the selected results in any are selected, with the selected columns in the column select dialogue	Read Permissions	None
Delete	Button	Deletes currently selected items assuming it passes the Validation.	Deleting Permission	None
Attach Item To	Button	Loads the Attachment page and any selected items are automatically attached to any uploaded Attachment	None	Only appears when Search page Entity has an Attachment i.e. Tag ITRs

Table 18. Details on Sections of the Standard Search page

#### 9.2.1.3.2 Available Search Fields

In hub2 there are many search filters available, so certain rules are applied to only display the fields most likely to be used for searching. If necessary, these rules can be overwritten at a section level.

#### 9.2.1.3.3 Rules

- All primitive properties on the item to be searched are shown i.e. strings, dates, booleans and integers.
- The unique identifying fields of any child entities are shown on the search i.e. Stadium Name, Manager Name.
- List items are not shown by default.
- Globally Unique Identifier (GUID) fields are not shown, as these are considered not to be human readable.

#### 9.2.1.3.4 Search Summary Bar

The Search Summary Bar gives a summary of the current search being performed in a short-hand format described below. This allow the user to review the search in one place rather than having to look through all the textboxes on the page.

In addition, text can also be typed directly into the Summary Bar allowing the user to manually input a search instead of having to find the correct search field on the page.

As items are typed into the Search Summary Bar the relevant search field is updated, and vice versa.

The Search Summary Format displays each filter in the following format:



[FieldName]:[Filter];

Field Name is the same as the label above the Search Field in the normal search while Filter is the same value as the search criteria in the text box itself.

If the user switches from using the Search Summary Bar to using the Search Fields, the Summary Bar might be reordered. This is to allow any new search filters to be added.

At the end of the Search Summary textbox is a button which, when pressed, will display a drop-down menu of all the available searches. Clicking on any of these searches will give more details about that field.

#### 9.2.1.3.5 Query String Searches

When a search is performed, the current URL will be updated with a query string version of the search being performed.

Details on the filters used, the sort order and paging information will be URL encoded and assembled into a query string which will be appended to the page URL to instruct the server of the desired search filter, sorting and current page of results to return.

An example complete URL for a Tag Search query could be as follows:



Figure 10. URL query string format

Each query string segment corresponds to a filter clause, order clause or paging clause. Each clause in the query is represented by a Key-Value pair separated by an '=' symbol, and each clause is separated from the next with an '&' symbol.

The order in which clauses appear in the query is not important and makes no difference to the result of a search.

#### 9.2.1.3.6 Delete Check

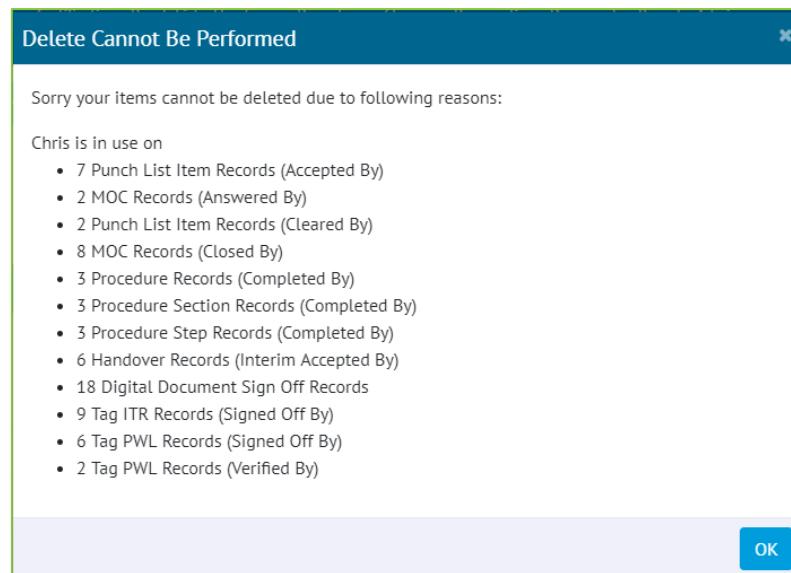
Before deleting an item, validation must take place to ensure it's not referenced by any other Entity in the database.

If any of the selected items fail the validation, a dialog box will appear notifying the user which selected records cannot be deleted, what entities are preventing the delete and a count of the number of records that are preventing the delete. If the item is referenced on the same table by several fields, then these counts will be displayed as separate rows with the column name in brackets.

To successfully perform the delete, the blocking entities must be either be removed or updated to no longer reference the problem value.

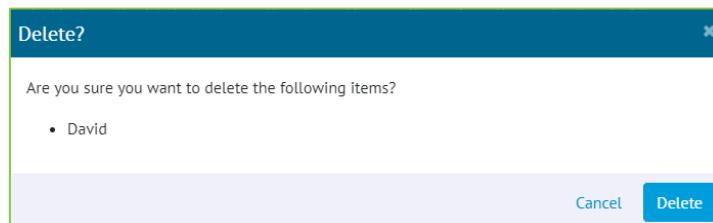
#### 9.2.1.3.7 Example

When trying to delete an Authorised Person (Chris) which is referenced by several other tables the following dialog is displayed:



**Figure 11. Screenshot of a Delete Block Dialog**

If there are no blocking reasons a dialog is still show asking the user to confirm the deletion:



**Figure 12. Screenshot of a Delete Confirm Dialog**

## 10 Standard View and Add/Edit Pages

### 10.1.1 View page

For most data stored in hub2, there is a View page which displays all the data in a read-only format. All hyperlinks for any reference data will lead directly to this view page. Any data on this page that is a reference value will be displayed as a hyperlink directly to the view page of that reference value.

#### 10.1.1.1 Overview of functionality / details of usage & workflow

##### 10.1.1.1.1 All Reference Tables

UI Element	Type	Description	User Restrictions	Feature Restrictions
Edit	Button	Directs the User to the Edit page for the current item	Editing Permissions	None
History	Button	Directs the User to the History page	Read Permissions	None
Search [Table Name]	Button	Returns the User to the Search page. [Reference Table Name] will be the Name of the Reference Table I.e. Subsystems	Read Permissions	None
Add [Table Name]	Button	Directs the User to the Add page for the current item	Adding Permissions	None

Table 19. Details on the Sections of a Standard Entity View page

### 10.1.2 Edit page

The Edit page for each entity will display all the associated fields which are editable by the user.

Any field which is a reference to another entity will have a Lookup Popup button (Q) next to it. Clicking this button will launch a popup that allows the user to select the value to be entered in the field.

If the page has a field that allows multiple items to be entered, such as Sub Systems on a Tag, an additional grid will be used. Adding items to this grid can be achieved by pressing the Add button to open a standard Lookup Popup, where items can be selected and added. Items already selected will be highlighted in the popup and deselecting an item from the list will remove it from selection. Items can also be removed by clicking on the red cross button ("x").

#### 10.1.2.1 Overview of functionality / details of usage & workflow

UI Element	Type	Description	User Restrictions	Feature Restrictions
Save	Button	Saves the changes made by the user	Adding or Editing Permissions	None

UI Element	Type	Description	User Restrictions	Feature Restrictions
Save & View	Button	Saves the changes made by the user and then navigates to the View page	Adding or Editing Permissions	None

Table 20. Details on the Sections of a Standard Entity Edit page

#### 10.1.2.2 Local Storage

Most Add/Edit pages will persist any user input which would previously be lost if a user's session needed to be re-authenticated during the users save request. The page will reload with their changes still in place, and a warning will be displayed to inform the user the information has not been saved. Clicking save a second time with a re-authenticated session will save the data permanently.

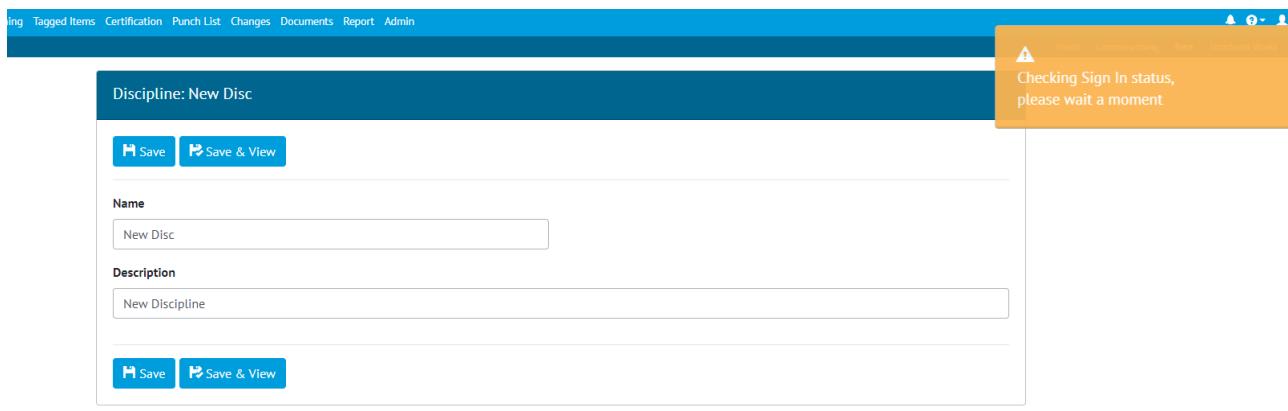


Figure 13. Checking User's sign in status.

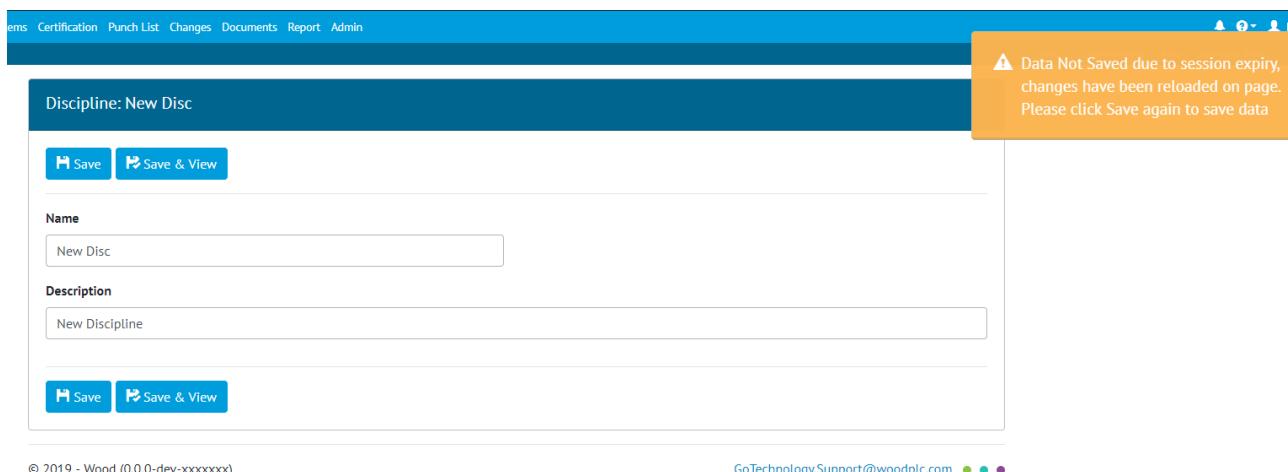


Figure 14. Data not saved but persisted on screen to be saved again.

#### 10.1.2.2.1 Exclusions

The following Add/Edit screens do not currently use local storage when attempting to save:



- Digital Document Checkbox Type
- Document Task Link
- Scheduled Report
- Handover Raise
- Handover Edit
- Report Creation

## 11 Exports

### 11.1 Definition

The Export feature will allow data to be extracted from the application into a format which can be opened by other software applications.

Typically, this feature would be used to support offline bulk editing of data which could then be re-imported in future, or to update third-party applications with current records from hub2.

Data can be exported in Excel (XLSX) for CSV Formats.

### 11.2 Pages

#### 11.2.1 Export

Each search page will contain an additional button to allow Exports to be performed.

When the Export button is clicked, a file will be downloaded by the browser containing the exported data in XLSX format.

The screenshot shows a search results page with a blue header bar. Below the header is a search bar with two input fields and a magnifying glass icon. Underneath the search bar is a blue banner with the text 'Show Additional Filters' and three buttons: 'Search', 'Clear', and 'Save Search'. The main area is titled 'Search Results' and contains a table with columns: Name, Description, Discipline, Sub System(s), and Tag ITR(s). The table lists six items. At the top of the table is a blue 'Export' button with a dropdown arrow. Two large yellow arrows point to this 'Export' button from both the left and right sides. At the bottom of the table is another blue 'Export' button with a dropdown arrow. Below the table are navigation controls (first, last, previous, next), a page number 'Page: 1 of 1 Go', a 'Page Size: 20 Change' dropdown, and a note 'Item 1 to 6 of 6'.

	Name	Description	Discipline	Sub System(s)	Tag ITR(s)
<input type="checkbox"/>	AX-ALPHA-041-PSV-3001	Meth Pump Suct Relief To Meth Storage Tank	M	AL-045-501	QED-A01A, QED-M39A, QED-P07B
<input type="checkbox"/>	AX-ALPHA-045-LST-3001	ALPHA LP Separator (35-4501)	I	AL-045-501	QED-I01A, QED-I02B
<input type="checkbox"/>	AX-ALPHA-045-PDAH-3008	LP Sep Gas To Flash Gas Cooler On JRP	I	AL-045-501	QED-E35A, QED-I01A
<input type="checkbox"/>	AX-ALPHA-045-PDIA-3008	LP Sep Gas To Flash Gas Cooler On JRP	I	AL-045-501	QED-E35A, QED-I02B
<input type="checkbox"/>	AX-ALPHA-045-PG-1000	Pressure Gauge	I	AL-045-501	QED-I01A
<input type="checkbox"/>	AX-ALPHA-045-SY-3002	LP Sep Gas To Flash Gas Cooler (SDV3002)	I	AL-045-501	QED-E35A

Figure 15. Location of “Export” button under Search Results, highlighted in orange.

#### 11.2.1.1 Filtering

When the Export button is clicked, all current search filters will be applied to the Export results. For example, filtering search results to only include a Tags associated with a specific Discipline and Sub System would include only the filtered Tags in the export, instead of exporting every Tag in the database. Filtering of exports is especially recommended when the data will be modified and re-imported later since the import can be targeted more specifically to limit the scope of any changes.

#### 11.2.1.2 Selecting Rows

For additional control over the selection of records to be included in the export, the user may select one or more records from the search results table prior to clicking the Export button.

If records have been selected in this way, the current search filters are ignored and only the selected records will be included in the file. If no records are selected, then all data which matches the current search filter will be included in the file, from all results pages.

For example, in the results grid shown in Figure below, only the second, third and fourth Tags will be included in the export file.

Search Results					
	Name	Description	Discipline	Sub System(s)	Tag ITR(s)
<input type="checkbox"/>	AX-ALPHA-041-PSV-3001	Meth Pump Suct Relief To Meth Storage Tank	M	AL-045-501	QED-A01A, QED-M39A, QED-P07B
<input checked="" type="checkbox"/>	AX-ALPHA-045-LST-3001	ALPHA LP Separator (35-4501)	I	AL-045-501	QED-I01A, QED-I02B
<input checked="" type="checkbox"/>	AX-ALPHA-045-PDAH-3008	LP Sep Gas To Flash Gas Cooler On JRP	I	AL-045-501	QED-E35A, QED-I01A
<input checked="" type="checkbox"/>	AX-ALPHA-045-PDIA-3008	LP Sep Gas To Flash Gas Cooler On JRP	I	AL-045-501	QED-E35A, QED-I02B
<input type="checkbox"/>	AX-ALPHA-045-PG-1000	Pressure Gauge	I	AL-045-501	QED-I01A
<input type="checkbox"/>	AX-ALPHA-045-SY-3002	LP Sep Gas To Flash Gas Cooler (SDV3002)	I	AL-045-501	QED-E35A

« 1 »      Page: 1 of 1 Go      Page Size: 20 Change      Item 1 to 6 of 6

Export Delete Attach Item To

Figure 16. Selection of records for Export, with check marks against rows two, three and four.

#### 11.2.1.3 Export Options

Further control of the Exports can be achieved by clicking the arrow next to the Export button and choosing Select Options. This will bring up a dialog allowing the selection of columns to be included in the export, and the ability to change the format of the export to CSV rather than the standard XLSX.

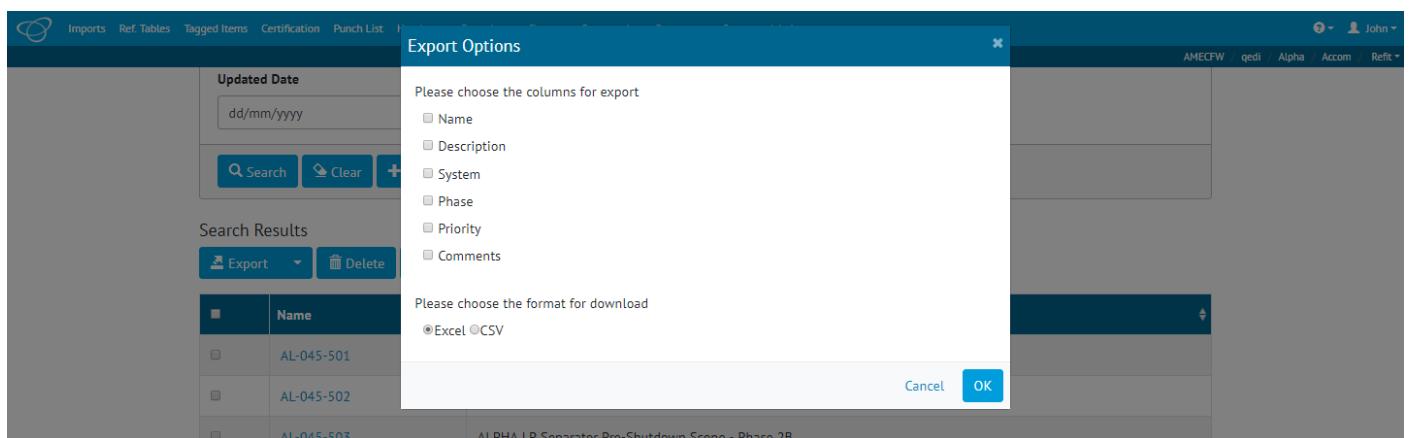


Figure 17. Screenshot of the Export Options

## 11.3 File Formats

### 11.3.1 Microsoft Open XML Excel Format (XSLX)

Data exported in XSLX format will conform to Open XML Standard which documents a standard for creating XML based files. Files Exported in XSLX will have a set of headers on the first row of the page, which will remain at the top even when scrolling. Each row on the export will then appear below the headers with the data arranged into the correct column.

Name	Description	System
AL-040-501	ALPHA LP Separator	AL-040
AL-048-501	Production Gas Scrubber	AL-048
AL-055-501	Injection Compressor	AL-055
AL-055-502	Injection Compressor	AL-055

Figure 18. Example XLSX File

The XLSX file also uses colours to show columns that form part of the Unique Identifier or are Required data.

Colour	Found
Dark Orange	Required and Unique
Light Orange	Unique
Blue	Required
Grey	Not Required or Unique

Table 21. Colour Definitions on a XLSX Import

Information relating to required or Unique columns can be found in the Import and Export section.

By default, the inbuilt filtering option will be activated but will not have any active filters. This functionality may or not be available depending on the spreadsheet software used.

### 11.3.2 Comma Separated Values (CSV)

Data can be exported in CSV format, which conforms to a standard for the handling of text-based fields and is widely accepted by programs which import data files. The standard defines the characters which represent records and fields within the data and can be summarised as follows:

- Each line will end with an MS-DOS-style line ending (CR/LF)
- The first line will be the header record
- Each record will contain the same number of comma-separated fields
- All fields will be separated (also known as ‘delimited’) with a comma



- All fields will be quoted (also known as ‘qualified’) with double quotes
- A double quote character within a field will be represented (also known as ‘escaped’) with two double quote characters
- The MIME type of the file will be text/csv

#### 11.3.2.1 CSV Example

An example of the contents of a CSV file for the export shown in Figure 2:

“Name”, “Description”, “Discipline”, “Subsystem”, “Tag ITRs”

“Tag-002”, “Actuator”, “E”, “040-02”, “QED-E01B”

“Tag-003”, “Light Fitting”, “E”, “040-03”, “QED-E01A”

“Tag-004”, “6”” Motor”, “E”, “050-01”, “QED-E01B”

## 12 Dates and Date Picker

### 12.1 Definition

The format of Dates varies by culture; for example DD/MM/YYYY versus MM/DD/YYYY. In order to accommodate this a Javascript tool called MomentJS will be used, allowing the date pickers themselves to be customisable (per user settings) while still sending the dates in the standard C# format.

### 12.2 Pages

#### 12.2.1 Date Picker

##### 12.2.1.1 Date Format

The list of formats currently supported by hub2 is shown below, along with an example of how the date would look on the 29<sup>th</sup> June 2016

Locale	Format
English (United Kingdom)	29 June 2016
English (United States)	June 29, 2016
French (Canada)	29 juin 2016

Table 22. Date Formats Supported by hub2

This standard format will be used for showing all dates in hub2 unless otherwise stated.

##### 12.2.1.2 Styles

Certain devices and browsers come with their own built-in date pickers. These are particularly useful for mobile devices where a standard calendar can be difficult for a user to use.

Whenever possible, hub2 will use the built-in date pickers for a device. These date pickers often have their own format for showing the date and could be different from the standard hub2 format chosen by the user.



Figure 19. Example of an iOS Date Picker

A standard date picker will be used instead for any browser without one built-in.

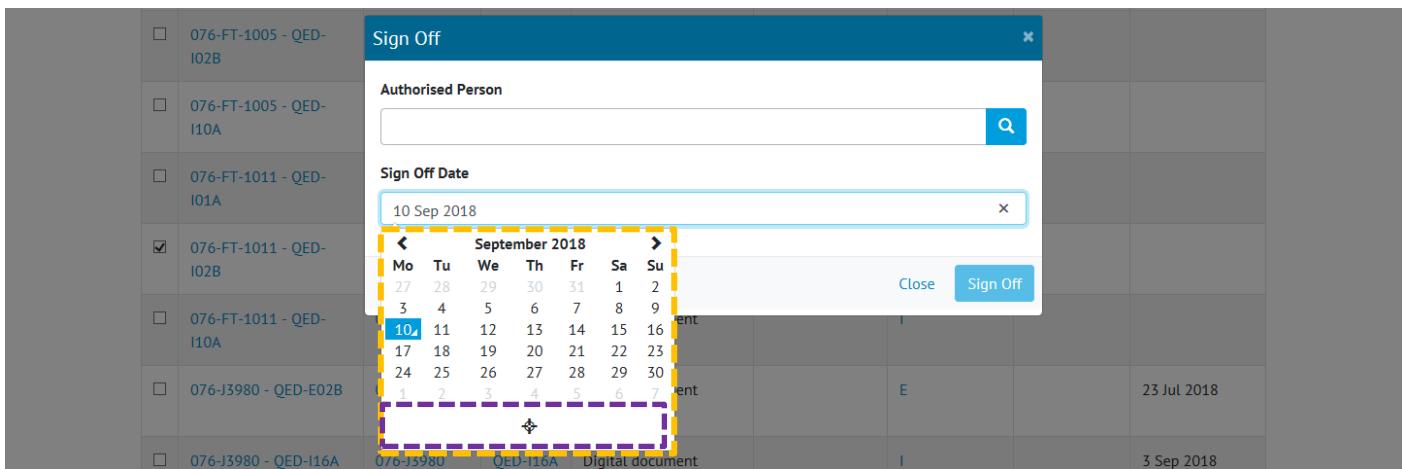


Figure 20. Screenshot showing Standard Date Picker (highlighted in orange) with button for selecting Today's Date highlighted in purple.

This date picker uses a calendar to allow the user to select a date with arrows to move between months. Clicking on the top bar takes the user to the next largest range (i.e. Months, Years, and Decades). The date shown once selected will be in the user's Date Format. There is also a button on the bottom to focus the calendar on today's date.

### 12.3 Validation

Dates will be validated to ensure they fall within the acceptable date range, which is 1<sup>st</sup> January 1950 (minimum) and 31<sup>st</sup> December 2099 (maximum). Certain dates, such as Completed Dates, will be validated in accordance with business rules to ensure they are not in the future.

## 13 Lookup Popup

### 13.1 Definition

The Lookup Popups are designed to allow the user to quickly look at another entity within hub2 for a reference value. For example, when the user is selecting an Equipment Type on a Tag, a Lookup Popup will be available to allow the user to search and select from the existing list of Equipment Types.

### 13.2 Pages

#### 13.2.1 Lookup Popup

##### 13.2.1.1 GUI Mock-up

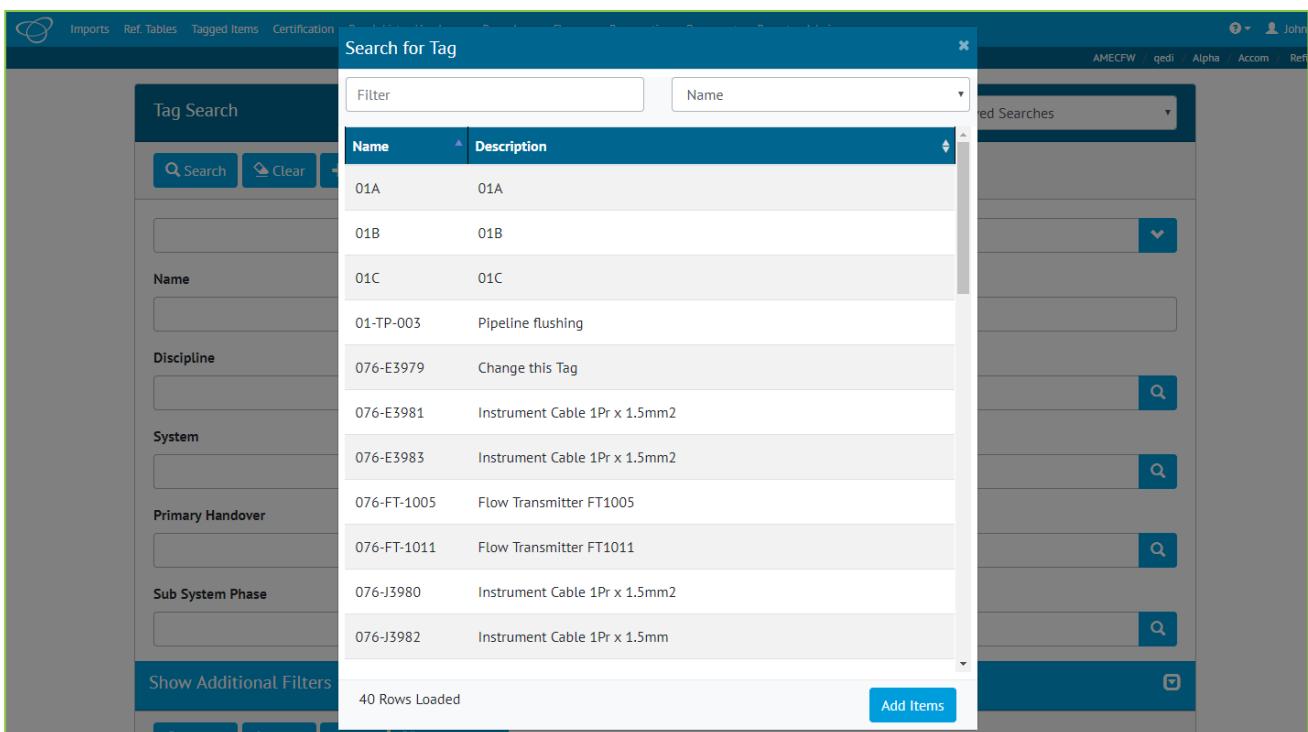


Figure 21. Screenshot of a Lookup Popup displaying Tag information.

##### 13.2.1.2 Overview of functionality / details of usage & workflow

###### 13.2.1.2.1 Loading/Scrolling

When loaded, the popup shows all the data on one large continuous list. When the user scrolls to the bottom of the list, more data is loaded until all the available data has been displayed.

To aid with finding the correct entry, a filter is available at the top of the popup that allows the user to search the on-screen data for a certain value.

###### 13.2.1.2.2 Filtering

When information is typed into the filter box the list will automatically filter. A drop-down box is available to the right of the filter box to change which field is being filtered. All searches performed on the popup are Contains type searches.

### 13.2.1.2.3 Selecting Records

The number of records loaded is shown at the top right. To select a record, the user clicks the row on the table, resulting in the row being highlighted. Existing records already selected when the popup is loaded are already be highlighted. If the Popup is used to select a single value, it will automatically close when the value is selected.

### 13.2.2 Text Box Button

#### 13.2.2.1 GUI



Figure 22. Screenshot of an Equipment Type field, with popup button on the right, highlighted in orange.

#### 13.2.2.2 Overview of functionality / details of usage & workflow

Pressing the Search button will launch an appropriate Lookup Popup for the text box.

## 14 Sign Off

### 14.1 Definition

Sign off is the process where the status of an item or activity is recorded. Traditionally, this is the process where an authorised person (i.e. a qualified individual performing the role for which they were employed) records their name, the date and the status of the item/activity alongside their signature.

More recently, the traditional sign off process has been replaced either partially or completely by recording the same information electronically.

Activities and items that are traditionally signed off as paper copies can be signed off electronically in hub2. These include ITRs, Handovers, Punch Lists, PWLs, Work Packs and individual tasks on digital documents. In cases where a physical signature is still required, a signed copy can be uploaded alongside the record of the activity.

For some activities in hub2 the sign offs are system-defined, static fields (e.g. Handovers), while in other places the user can configure the sign offs required for each document (e.g. Tag ITRs). For more information on configuring sign offs see the “Flexible Sign Off” section.

### 14.2 Pages

The following methods are used to accomplish the sign off process.

#### 14.2.1 Sign Off Dialog

The Sign Off dialog is used in conjunction with a table of items that can be signed off, normally on a Search page. The user selects one or more items from the table and then clicks the “Sign Off” button. If all the items can be signed off the Sign Off dialog will be displayed.



Figure 23. Screenshot of a Sign Off dialog

The Sign Off dialog contains two fields, the Authorised Person is selected using the lookup and the Sign Off Date is selected using a standard date picker. Both fields are required and the “Sign Off” button remains in the inactive state until values are entered.

Clicking “Sign Off” will sign off all the items with the Authorised Person and Sign Off Date provided. Clicking “Close” or the cancel button at the top right of the dialog terminates the sign off process and closes the dialog.

Users with User Sign Off only permission will not be able to select an Authorised Person using the lookup. The date can be selected and the sign off will be performed using the Authorised Person associated with their user login.

An alert will be displayed and the Sign Off dialog will not be opened if:

- Any of the selected items are already signed off
- The user is not associated with an Authorised Person or the Authorised Person does not have permission to sign off the items

The Sign Off dialog is also used for other system-defined sign offs, for example, Accepting or Verifying. When completing these processes, the word “Sign Off” may be changed to match that process i.e. when verifying items, the word “Sign Off” will be replaced by “Verify”.

#### 14.2.2 Sign off Panel

The screenshot shows a software interface for managing Tag ITRs. At the top, there's a navigation bar with links like Imports, Ref. Tables, Tagged Items, Certification, Punch List, Handovers, Procedures, Changes, Preservation, Documents, Report, Admin, and a user profile for John. Below the navigation is a search bar for 'Tag ITRs' and a button to '+ New Tag ITR'. The main content area is titled 'Tag ITR : 076-E3979 - QED-I31A - 1'. On the left, there are two buttons: 'Edit' and 'History'. The central part of the screen has a blue header with an error message: 'Document cannot be generated as there is no template'. Below this, a section is highlighted with an orange dashed border. It contains a red circle icon and the text 'Not Signed Off'. To the right of this section is a 'Sign Off' button. Below this section, there are input fields for 'Signed Off By' (with a search icon) and 'Signed Off Date' (with a date picker). Further down, there are several status indicators and dropdowns: 'Document Code BXGLDK', 'Tagged Item 076-E3979', 'Test Reference 1', 'Primary Handover (None)', 'Signed Off By (None)', 'Tag ITR Completion Status (None)', 'Assigned To (None)', 'Comments (None)', 'Document Reference (None)', 'ITR QED-I31A', 'Job Card (None)', 'Secondary Handover (None)', 'Signed Off Date (None)', and 'Certification Grouping (None)'. At the bottom of the main content area, there's a 'Sub Systems' section with a table:

Sub Systems		
Name	Description	System
AL-070-504	LP Hydrocyclone Package - Phase 2B	AL-070

At the very bottom, there's a 'Attachments' section with a 'Upload New' button.

Figure 24. Screenshot of a Tag ITR View page with the Sign Off Panel highlighted in orange.

The Sign Off panel is displayed on the View page for any individual items which can be signed off. The Sign Off panel header displays an indicator showing the number of Sign Offs and how many have been completed. Clicking on the Sign Off panel header expands the panel to show all the Sign Offs for the item.

In the expanded panel, Sign Offs which are complete display a green tick, the Sign Off Name, the Authorised Person Name and the Sign Off Date. Sign Offs which have not been completed display a red cross, the Sign Off Name and a “Sign Off” button. Clicking the Sign Off button expands a panel which allows the user to select the Authorised Person and Sign Off Date.



Users with User Sign Off only permission will not be able to select an Authorised Person using the lookup. The date can be selected and the sign off will be performed using the Authorised Person associated with their user login. If the user is not associated with an Authorised Person or the Authorised Person doesn't have permission to sign off the item, an alert will be displayed.

## 15 Assignment

### 15.1 Definition

During the lifecycle of a project, tasks can be assigned to individual members of the workforce so work can be allocated to the most appropriate personnel. For example, Tag ITRs relating to the Electrical Discipline could be assigned to the electrician employed to carry out the commissioning of a Sub System.

### 15.2 Assignable Entities

hub2 allows Tag ITRs, Punch List Items, Tag PWLs, Job Cards and Work Packs to be assigned to Authorised Persons who can Sign Off the respective items.

### 15.3 Pages

The Assigned To field is visible on the view and edit pages for each assignable entity, it also appears as a Search Filter for that entity type. The Assigned To field is also available in Imports, Exports and Detailed Reports.

Work Packs also have an optional Assigned Date field.

#### 15.3.1 Search Results – ‘Assign to Me’ Button

The ‘Assign to Me’ button will behave similarly to the ‘Assign’ button, but will only be displayed for users with a Role which allows the Action ‘User Assign’. The button will only allow the items to be assigned to the Authorised Person associated with the current user, and not to any other person. If the user does not have an associated Authorised Person, or has one that does not have suitable permissions, then a warning message will be displayed and no popup will be shown.

The screenshot shows a search results interface for Tag ITRs. At the top, there are three buttons: 'Export' (with a dropdown arrow), 'Generate', and 'Assign to Me'. The 'Assign to Me' button is highlighted with a red box. Below the buttons is a table header with columns: 'Name', 'Tagged Item', and 'ITR'. The table contains one row of data: '01-TP-003 - QED-A06A', '01-TP-003', and 'QED-A06A'.

Name	Tagged Item	ITR
01-TP-003 - QED-A06A	01-TP-003	QED-A06A

Figure 25. Assign to Me button on Tag ITR Search Results



Figure 26. Tag ITR Assignment to User's Authorised Person

UI Element	Type	Description	User Restrictions	Feature Restrictions
Assign	Button	When clicked, shows the Assignment popup	Assign permission on the entity	None
Assign to Me	Button	When clicked, shows the Assignment popup (current user only)	User Assign permission on the entity	None

Table 23. Buttons shown on Assignable Entity Search Results

### 15.3.2 Assign Dialog

The Assign dialog is used in conjunction with a table of items that can be signed off, normally on a Search page. The user selects one or more items from the table and then clicks the “Assign” button. The Assign dialog will be displayed.

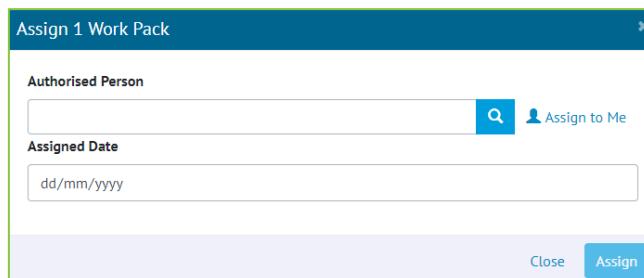


Figure 27. Screenshot of an Assignment Dialog

The dialog contains two fields, the Authorised Person is selected using the lookup and the Sign Off Date is selected using a standard date picker. The Authorised Person lookup is filtered to list only those users who have Sign Off permissions for the entity, this prevents assigning an item to a user who cannot complete the Sign Off. There is also an “Assign to Me” link which prepopulates the Authorised Person with the details associated with current user. The “Assign” button remains in the inactive state until an Authorised Person is selected.

Note that the optional Assigned Date field is only available for some entities, for example, Work Packs.

Clicking “Assign” will assign all the items to the Authorised Person with the Assigned Date if provided. If any of the items were already assigned, they will be reassigned to the new Authorised Person. Clicking “Close” or the cancel button at the top right of the dialog terminates the assign process and closes the dialog.

An alert will be displayed and the items will not be assigned if the Authorised Person entered does not have permission to sign off the assigned items.

### 15.3.3 Assignment Panel

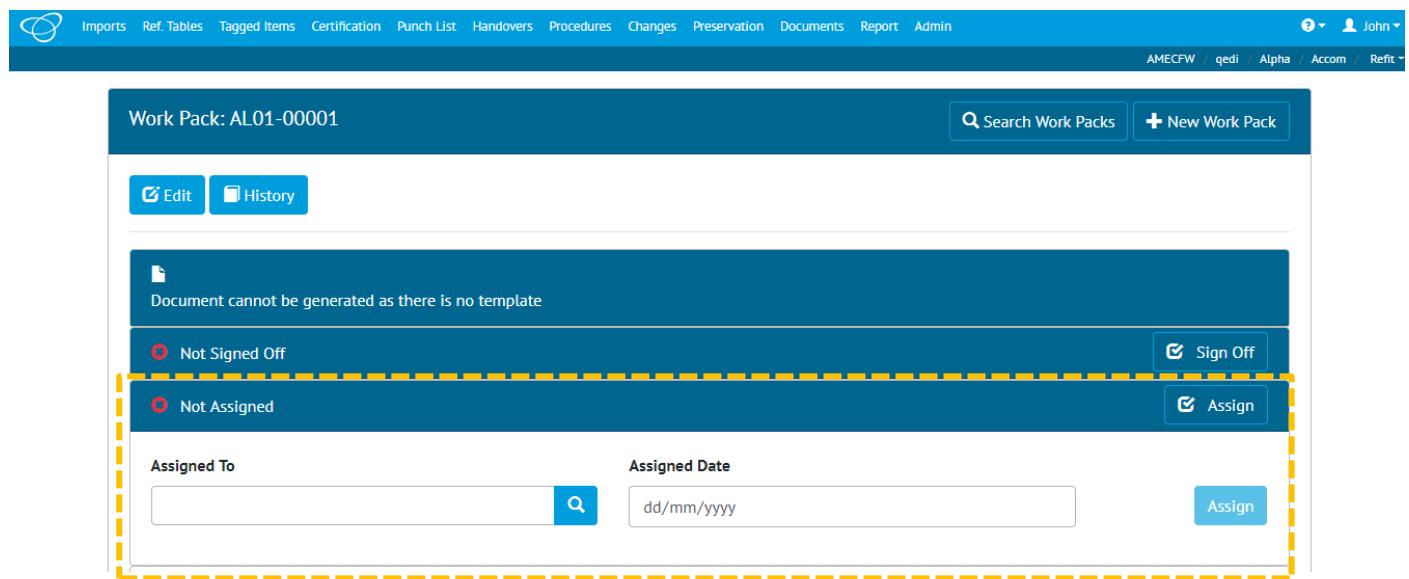


Figure 28. Screenshot of a Work Pack View page with the Assignment Panel highlighted in orange.

The Assign panel is displayed on the View page for any individual items which can be assigned. The Assign panel header displays the Authorised Person Name if it has been assigned and an information message if it has not been assigned. Clicking on the Assign panel header expands the panel to show the details for editing the assignment.

In the expanded panel the Authorised Person and Sign Off Date (where available) are displayed.

Users with User Assign only permission will not be able to select an Authorised Person using the lookup. The date can be selected (if available) and the item will be assigned to the Authorised Person associated with their user login. If the user is not associated with an Authorised Person or the Authorised Person doesn't have permission to sign off the item, the item cannot be assigned to them and an alert will be displayed.

### 15.4 Validation & Business Rules

- To assign items to any Authorised Person, the user must have ‘Assign’ permission for the entity
- To assign items to their own Authorised Person, the user must have ‘User Assign’ permission for the entity
- ‘Assign to Me’ is only possible if the user has an Authorised Person associated with their account
- An Authorised Person can only be used for assignment if:
  - It is enabled

- It has the relevant Sign Off permissions (for example, Tag ITR Sign Off for assigning Tag ITRs)
- The Assigned Date field is optional.

## 16 Notification

### 16.1 Definition

Notifications inform the user that one of the following events has taken place:

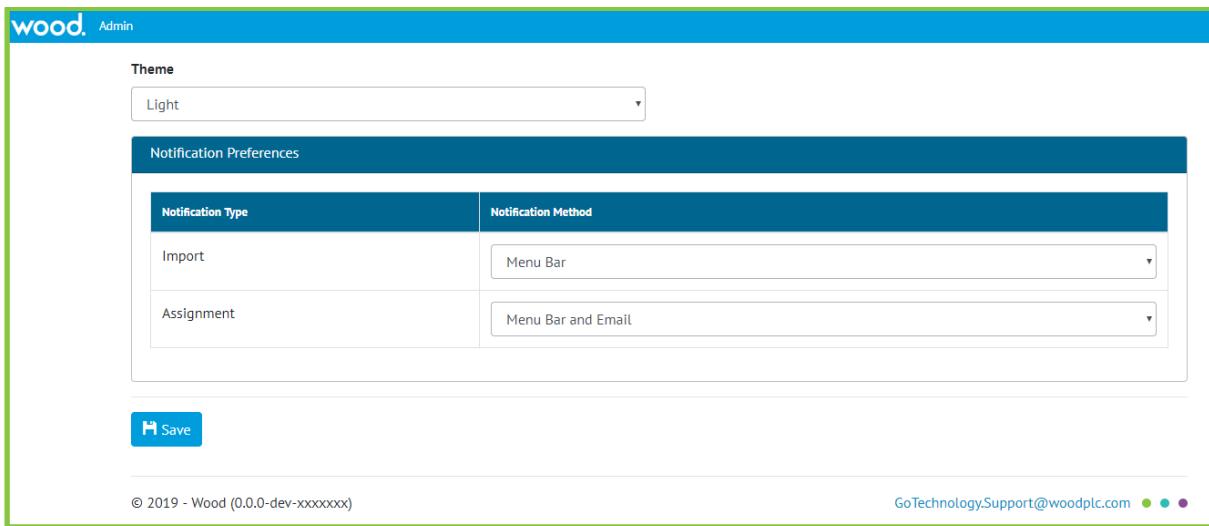
- An import has completed successfully
- An import has failed to complete
- An Entity (i.e. Job Card, Procedure, Tag ITR etc.) has been assigned to a user
  - For an assignment notification to be sent, the Authorised Person must have an associated User account set in the Authorised Person Reference Table
- A Tag ITR Status has changed
- A full set of Work Pack or Handover documentation has been generated
- An MOC has been raised against a Job Card
- The status of a Job Card or Tag ITR has changed

Notifications are available as emails, on-screen alerts (aka “toasts”) and messages in the Notifications Panel. Notifications are not issued when the user assigns an item to themselves i.e. If the user assigns a Tag ITR to themselves, they will not be notified.

### 16.2 Functionality

#### 16.2.1 User Settings

By default, all three methods of notification are used to inform the user of events. The User Settings page is used to configure the user’s preferred notification method for specific notification types – currently, this is limited to Import, Assignment and Generate notifications. If the user has access to multiple instances in hub2 the same preferences apply to all instances.



Notification Type	Notification Method
Import	Menu Bar
Assignment	Menu Bar and Email

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Figure 29. User Settings page

### 16.2.2 Notifications Panel

The Notifications Panel is from the bell icon in the menu bar. This icon changes colour to indicate new notifications. Clicking the icon opens the Notifications Panel to show all read and unread notifications. New notifications are indicated with a coloured dot.

Notifications are removed from the panel individually by clicking the “X” next to the notification, or all at once by clicking the “Clear All” button. Notifications will be removed automatically when they are two weeks old.

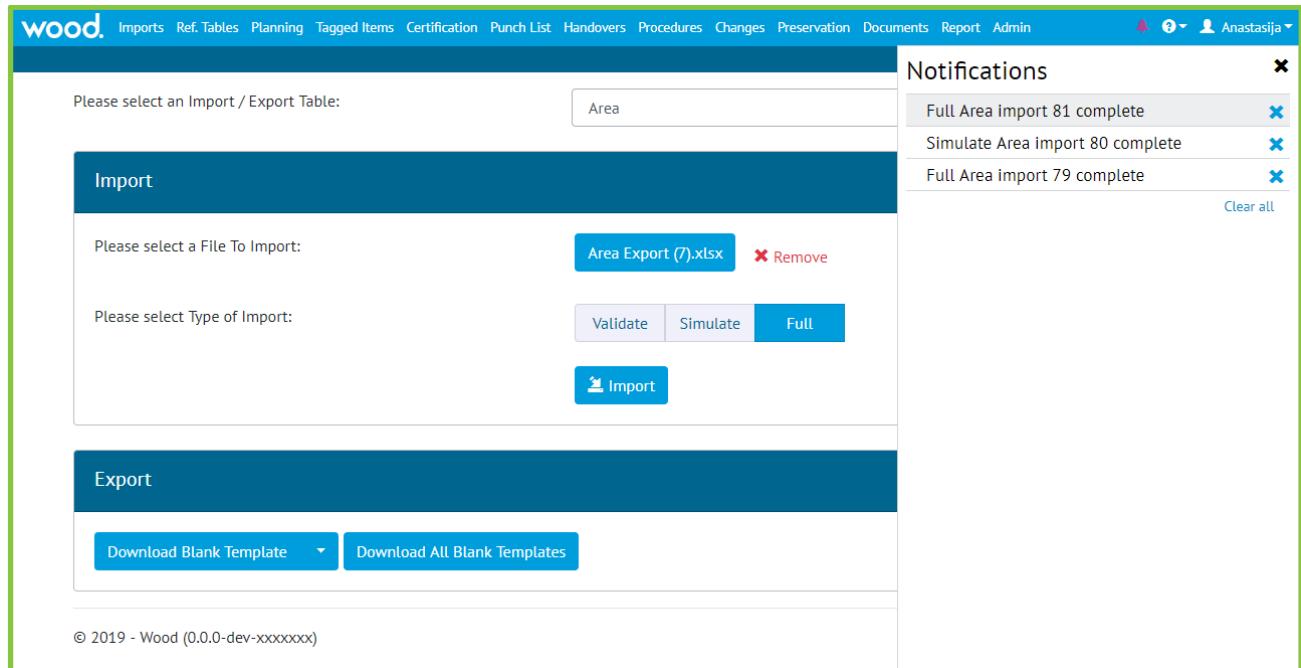


Figure 30. Notification Panel in menu bar

### 16.2.3 On-screen Alerts

If the user is signed in at the time a notification is triggered, they will see an on-screen (toast) alert appear immediately at the top right of the screen. The alert contains brief details of the event and may have links to further information.

If the user is not signed in, the notification is available in the Notification Panel the next time they log in. They will also receive an email notification.

Imports Ref Tables Planning Tagged Items Certification Punch List Handovers Procedures Changes Preservation Documents Report Admin

Please select an Import / Export Table: Job Card

**Import**

Please select a File To Import: Job Card Export (13).xlsx ✖ Remove

Please select Type of Import: Validate Simulate Full

⚡ Import

**Export**

Download Blank Template Download All Blank Templates

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**Full Job Card import (25) complete**

Added	Deleted	Updated	Invalid	Unchanged
0	0	0	0	1228

[View results](#)

Figure 31. Example of an on-screen notification

#### 16.2.4 Notification Email

Hi Paul Goss,

2 Tag ITRs were assigned to you

To view your assigned Tag ITRs click the following button

[View Assigned Tag ITRs](#)

If you have any queries relating to this notification, please do not hesitate to contact the [qed Software Support Team](#).

Thanks,  
qed Software Support Team

---

If you're having trouble with the button above, copy and paste the URL below into your web browser.

<https://localhost:44381/TagITR?AssignedTo.Name%3Aeq=Paul%20G>

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Figure 32. **Notification Email from Tag ITR Assignment**

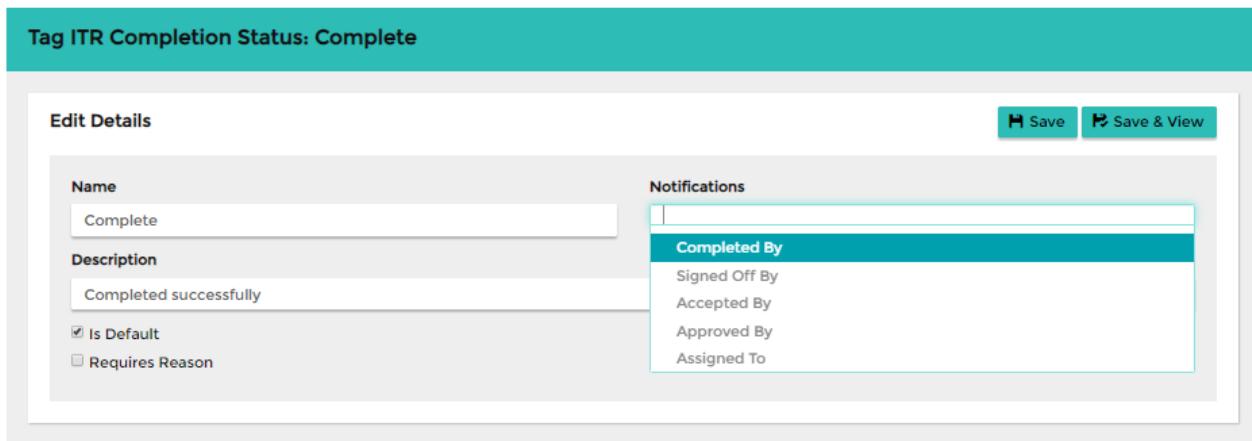
Email notifications are generated and sent to the appropriate hub2 user account i.e. for assignment, the user to which the item was assigned or for imports, the person who actioned the import. They summarise the event that has occurred, provide a link to the output or assignment and a link to the Support team.

When multiple items are actioned simultaneously, a single notification is emailed instead of a notification per item. Email notifications are not be generated when the user assigns items to themselves.

#### 16.2.5 Tag ITR Completion Status Notification

Each Tag ITR Completion Status can be configured to raise a notification. This setting is enabled from the Tag ITR Completion Status Edit page by optionally selecting one or more Sign Offs which alert the user of a status change. The drop down list of available Notifications includes all ITR Sign Offs plus “Assigned To”.

Notifications are only generated for the Tag ITR Completion Status if the matching Sign Off is allocated to the ITR and an Authorised Person has signed off the item.



Tag ITR Completion Status: Complete

Edit Details

Name: Complete

Description: Completed successfully

Is Default

Requires Reason

Notifications

Completed By

Signed Off By  
Accepted By  
Approved By  
Assigned To

Save Save & View

Figure 33. Tag ITR Completion Status Notification

## 17 Attachment

### 17.1 Definition

In hub2 several different Entities can have Attachment linked to them such as Tag, Tag ITRs, Tag PWLs and Drawings. Some of these Attachment may be documents produced by the application, filled out and then attached back into the application, others could be technical diagrams, pictures or other documents that are useful for the commissioning process.

The following sections can have Attachments

- As Built Drawing
- Assurance Tracker
- Drawing
- Handover
- Job Card
- MOC
- Procedure
- Punch List Item
- Subsystem
- System
- Tag ITR
- Tag PWL
- Tagged Item (Tag, Test Pack, Lines, Spools etc.)
- Work Pack

This list of possible Entities that Attachments can be attached to are called Document Types.

### 17.2 Standard Functionality

#### 17.2.1 Adding an Attachment

TB Adding Attachment Add page allows multiple attachments to be attached at one time. One Attachment can also be attached to multiple documents. Up to 20 Attachments can be uploaded at one time, each attachment will be processed separately.

It is possible in hub2 to apply restrictions when uploading attachments to Drawings. The Level C Single Drawing Attachments setting restricts the number of attachments per Drawing to one.

#### 17.2.2 Deleting an Attachment

Attachments can be deleted via the Attachment Search page or via the Attachment grid on the actual Entity. Any Attachment could be linked to multiple different entities and so when deleting a warning will be given if the Attachment is linked to one or more entities.

If the attachment is attached to more entities, then have been selected then the user will be warned and given the opportunity to delete only the selected links or delete the underlying attachment. Deleting the underlying attachment will also delete all other links from that Attachment.



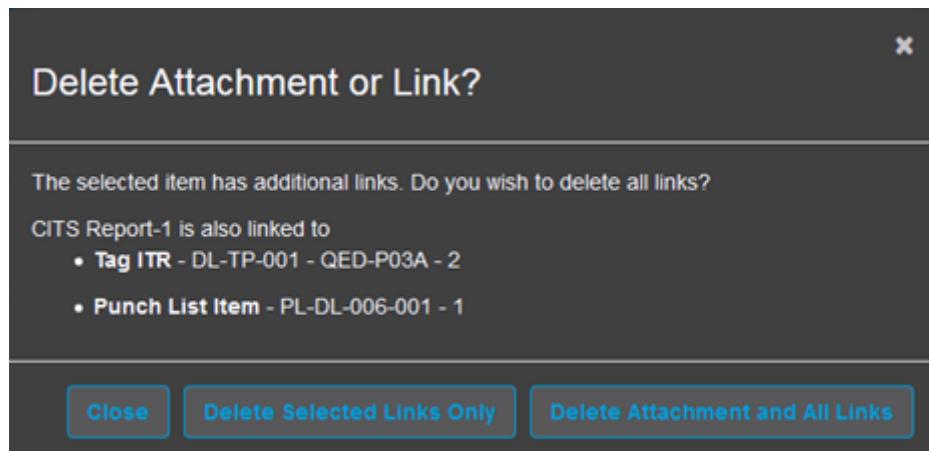


Figure 34. Screenshot showing the Delete Dialogue for Deleting Attachments or Links.

### 17.3 Attachment Panel

On each Entity that has an Attachment there will be an Attachment Panel, this panel will contain grid allows the user to download, add and delete attachments directly on the Entity itself. As with the Attachment Upload page only 20 attachments can be added at a time.

UI Element	Type	Description	User Restrictions	Feature Restrictions
Upload New	Button	Opens a File Selector allowing the user to select one or more files	Add Permission	None
Confirm	Button	Appears against any pending attachment (created via the Upload New button). Confirms the upload	Add Permission	None
Cancel	Button	Appears against any pending attachment (created via the Upload New button). Cancels the upload	None	None
Download	Button	Downloads the attachment	Read Permission	None
Delete	Button	Shows the Delete Dialogue asking to confirm deleting the Attachment.	Delete Permission	None
Replace Attachment	Button	Appears in replacement of Upload New, Show the Delete Dialogue asking to confirm deleting the current Attachment. Opens a File Selector allowing the user to select one file.	Add Permission Delete Permission	Only visible on Drawings View when "Single Drawing Attachments" is enabled

Table 24. List of buttons on the Attachment Panel.

## 17.4 Pages

### 17.4.1 Attachment Search

The Attachment Search page work in a similar manner to the standard search pages with a couple of exceptions. Since Attachments can be attached to multiple different Entities a “Document Type” drop down will allow the user to search for a specific Entity (such as Tag ITR or Drawing).

There will also be separate searches to search for the item that attachment is linked to i.e. If an Attachment is linked to a MOC then the user can search for the Name and find all the attachments for that MOC will be shown.

If searching by Tagged Item then the attachment will also show Tag ITRs, Tag PWLs and attachments associated with the Tagged Item.

As Attachments represent files no Export will be available and the button for this is hidden.

### 17.4.2 Attachment Add (Upload Page)

The Attachment Upload page allows multiple Attachments to be uploaded at once to various different entities.

This is done via the “Select Files” button. Clicking this will bring up a file picker and the user can select one or more files. Once confirmed each Attachment will be added to the pending Attachments and will be given a table with details on each Entity Linked to.

An Attachment must be given a link before the Upload button can be clicked. Attachments can also be uploaded by dragging the attachment onto the Upload area, the area where the attachment can be dropped will be highlighted.

#### 17.4.2.1 Manually Linking Attachments

Each Attachment can be linked to multiple different entities before being fully uploaded. An Attachment must be linked to at least one Entity before being uploaded. First the Attachment must be assigned to a Document Type such as Tag or Tag ITR, once this is selected a button can be clicked to bring up a Standard Popup that allows the user to select the actual items to be Attached To. Multiple items be selected at once and this will add additional links to the Attachment.

Attachments can be linked to different types by adding new links and selecting a different Document Type.

#### 17.4.2.2 Document Codes

Document Codes can also be used to Link Attachments via the “Use Document Code” button. Once selected a new textbox appears allowing the user to type in the Document Code. If the Code is valid the Document Type and Attached To section will fill in automatically. Document Codes can also be used by uploading a file with the Code as the start of the filename annotated by square brackets i.e. “[LHVMBM] – Document.docx”. This will automatically pick up the Code LHVMBM and attach it to the correct place.



#### 17.4.2.3 Buttons

UI Element	Type	Description	User Restrictions	Feature Restrictions
Select Files	Button	Opens a File Selector allowing the user to select one or more files	None	None
X	Button	Appears against each link and removes the corresponding link from the Attachment Link Table	None	None
Use Document Code / Manually Assign	Button	Appears against each link. Changes the link between using a Document Code or Manually selecting the Attachment Link	None	None
Add Link	Button	Adds another link to the Attachment Link table	None	None
Upload	Button	Uploads the attachment.	None	None
Upload All	Button	Uploads all pending attachments.		
Cancel	Button	Cancels the uploading of the attachment and removes it from the pending attachments	None	None
Clear	Button	Appears once an attachment has been uploaded.  Removes the confirmation of the Attachment from the page.	None	None
Search Attachments	Button	Links to the Attachment Search page	Read Permission	None

Table 25. Adding Attachment page buttons

#### 17.4.3 Attachment Edit

Editing Attachments allows users to change the Name, Description and Entities the file is linked to, it also allows users to change the actual file itself.

##### 17.4.3.1 Uploading Attachment

This is done via the “Change File” button. Clicking this will bring up a file picker and the user can select a single file to upload. The button will change to “Change File to [Attachment.docx]” showing the user a new file will be uploaded on Save. This will not change the existing name of the Attachment Record; it only changes the Document associated with that record.



#### 17.4.3.2 Linking Attachments

Much like when adding a new Attachment, attachments can be linked to different entities. The process for picking the links is the same as when adding an Attachment and as before an attachment must have one link to be successfully saved.

#### 17.4.3.3 Listing of fields / clarification of details on page

##### 17.4.3.3.1 Buttons

UI Element	Type	Description	User Restrictions	Feature Restrictions
X	Button	Appears against each link and removes the corresponding link from the Attachment Link Table	None	None
Use Document Code / Manually Assign	Button	Appears against each link. Changes the link between using a Document Code or Manually selecting the Attachment Link	None	None
Add Link	Button	Adds another link to the Attachment Link table	None	None
Search Attachments	Button	Links to the Attachment Search page	None	None
Upload All	Button	Uploads all the attachments currently awaiting upload in the grid	None	None
History	Button	Navigates to the History page for this <u>Tag</u> .	Read permissions	None
Save	Button	Saves any changes the attachment.	Create/Update permissions	None

Table 26. **Editing Attachment page buttons**

#### 17.4.4 Upload Barcoded Documents

If a document has been printed off and manually completed, either from a Digital Document template or a Word Document then it cannot be uploaded via the Digital Document page since it's no longer readable by hub2. Instead it must be scanned in as an Attachment. To aid in the scanning in of multiple documents, each document has a barcode located somewhere within the document. The barcode can be read by hub2 and used to allocate the document to the correct record.

##### 17.4.4.1 Uploading Barcoded Document

Barcode Documents can be uploaded using the “Upload Barcoded Documents” page, the page allows the user to upload a file and the system will automatically scan it and give details of the associated record in hub2.



If multiple documents are scanned in one PDF Document, the application will automatically split them out based on the Barcodes. Pages without a barcode will be treated as if they are allocated to the same document as the last successfully read barcode.

#### **Example**

If a document is upload with 4 pages, page 1 has code ABC, page 2 has code DEF, page 3 has no code and page 4 has XYZ, then the document will be split into 3 separate documents with page 1 allocated to the record associated with ABC, pages 2 and 3 with the record associated with DEF and page 4 with the record associated with XYZ.

Once the barcode reading is done the user will be presented with the result prior to uploading completed this allows the user to review which documents each page has been allocated to. Barcode reading is not 100% accurate and so barcodes can be missed. This page allows the user to manually add in missing documents, change which pages are allocated to each record and remove pages they don't want to be allocated.

#### **17.4.4.2 Changing Pages**

Under each document there is a section called “Pages” this section contains a box for each page allocated to that document. These boxes can be dragged and dropped between the various pages sections for each document, doing this will move the page to that document. The pages themselves within each box can also be reorder and when saved the pages will be placed in that order within the new document.

There is also a section called “Unmapped Pages” this will only contain pages if the first page(s) of the uploaded document didn’t contain a barcode. Pages contained within this section will be ignored. Pages can be dragged from the section to the correct document, alternatively pages that the user doesn’t wish to be included can be dragged to this section and they will not be allocated to a document.

#### **17.4.4.3 Adding an additional Document**

Clicking “Add Document” will create a new table on the page that can then be manually allocated to a record. The user will have to manually search for the record using the drop down and popup provided. This is the same method used as when manually attaching using the attachment upload page.

The user can then manually move pages to this new document once added to allocate the correct pages to this new document.

#### **17.4.4.4 Remove a Document**

A document and its associated records can be completely removed using the Delete link the top right corner. Any pages allocated to that document will be automatically moved to the unallocated pages section.

#### **17.4.4.5 Editing/Deleting a Record**

If a record is incorrect it can be manually changed using the drop down and “Find” popup provided. The user can also remove the record completely by clicking the remove link in the left-hand side. Each document must have at least one record when attached or else it will fail validation as there will be no record to associate the document with



#### 17.4.4.6 Add Link

By default, a barcode will be attached to one record at a time since a barcode is only associated to one record in hub2. The user can manually associate a document with another record using the Add Link. This will add a new row to the table and allow the user to manually search for the other entity to attach to.

UI Element	Type	Description	User Restrictions	Restrictions
Select Files	Button	Displays the File Select dialogue.	None	None
Delete	Link	Deletes the document and all associated records	None	None
Remove	Link	Removes a record association from the document	None	None
Document Type	Drop Down	Drop Down for choosing the Type of Record to search for i.e. Tag ITR, Punch List etc.	None	None
Find [Entity Name]	Button	Creates a popup to find a record within hub2. The label of the button and the popup displayed deepened on the Document Type Drop Down	None	None
Pages	Panel	Pages associated with this document from the original source document. These can be dragged and dropped into different document.	None	None
Add Link	Button	Adds a new record link to the document table allowing a document to be associated with one or more records	None	None
Add Document	Button	Adds a new row to the table to allow the user to manually allocate pages to a new document	None	None
Confirm	Button	Confirms the details for the Document are correct and completes the upload allocating the document pages to the items shown in the grid	None	None
Cancel	Link	Cancels the current upload	None	None

Table 27. Uploading Barcode Document Buttons

## 17.5 Validation & Business Rules

### 17.5.1 Allowed file types

The following types of file can be uploaded to the hub:

csv

doc/docx

dot/dotx

jpg/jpeg

odt

pdf

png

ppt/pptx

rtf

tex

txt

xls/xlsx

### 17.5.2 Amount of storage

When uploading an Attachment there is a total storage limit that is configurable by Level C. This storage limit applies to the Level and effects all users using the Attachment section. Based on how close the attachment section is to going over that limit different warnings or errors will be given

% of Limit	Warning/Message	Can Upload
0-90%	No Warning	Yes
90%-100%	Warning that the storage limit is close	Yes
100%-110%	Warning that the storage limit has been exceeded	Yes
110% and above	Message saying no further files can be uploaded as no available storage	No

Table 28. Storage Warning Messages

The Calculation for % of Limit includes the Attachment being added so if the limit is 100MB and a user have 99MB stored and are attaching a 2MB file this will take the limit to 101%.

### 17.5.3 Size limit

Attachments must be less than 40MB (with a Mega Byte being 1,024 Bytes) to be uploaded to hub2.

### 17.5.4 Single Drawing Attachments

When uploading Attachments to Drawings, it is possible to restrict this to one Attachment per Drawing. This feature is selected at Level C.



## 18 Document Code

### 18.1 Definition

#### 18.1.1 Document Codes

In hub2 there are several different sections that produce documents such as Tag ITRs, Tag PWLs and Punch List Items. Each document features a ‘Document Code’ that serves as a unique identifier throughout an instance of hub2. Document Codes will be completely unique meaning a Tag ITR and Punch List Item cannot have the same Code.

The following sections will have Document Codes

- Handover
- Punch List Item
- Tag PWL
- Tag ITR
- MOC
- Work Pack
- Job Card

#### 18.1.2 Code Format

The Code format will adhere to the following rules:

- Alphabetic characters only (e.g. A-Z. No numbers, spaces, punctuation or special characters.)
- ALL UPPERCASE (No lowercase letters).
- Only consonants (No vowels).

The latter requirement is to prevent recognisable words from appearing as Document Codes, as this is considered undesirable.

#### 18.1.3 Generation

A new Document Code with a random, unique Code value will be produced when a new ‘code-able’ Entity (e.g. an Entity that will have an associated Document Code, such as a Tag ITR or Punch List Item) is added. The unique Code will be used throughout the life of the document and will not (and indeed cannot) change when information about that Entity changes.

## 18.2 Pages

#### 18.2.1 Entity Search

The Code field will be available on all the search pages that use Document Codes i.e. Tag ITR, Punch List Item. This will allow the search of these items by the Code.

#### 18.2.2 Entity View

The Document Code should appear on all View pages for a document.



### 18.2.3 Document Search

#### 18.2.3.1 Overview

It will be possible to look up an item directly by Document Code using the Document Search page.

From here user can enter a Code value to search on this Document Code or select from the 5 most recent Codes entered.

The following conditions apply when searching via this page:

- Figure 1. There are no ‘partial matches’; only a complete six-letter Code can be used.
- Figure 2. Only one Code can be searched on at a time.
- Figure 3. Only letters are accepted in the “Document Code” field, and they are automatically converted to UPPER CASE when typed.

The screenshot shows a web application interface for document search. At the top, there is a navigation bar with links: Imports, Ref. Tables, Tagged Items, Certification, Punch List, Handovers, Procedures, Changes, Preservation, Documents, Report, Admin. On the far right, there is a user profile for 'John' and some system links: AMECFW / qedl / Alpha / Accom / Refit. Below the navigation bar, the main content area has a title 'Lookup Document Code'. It contains a search input field labeled 'Type in a Document Code' with the value 'DTYCLW' and a 'Recent Codes' dropdown menu showing 'Codes'. A table below displays the search results for 'DTYCLW':

Code	Document Type	Document Name
DTYCLW	Tag ITR	01-TP-003 - QED-A06A

Figure 35. Example of the Document Search page

#### 18.2.3.2 UI Listing

The Document Search page contains a single search field, along with a recent Codes Drop Down and a Result Grid. As such, there are no specialised UI elements to list.

### 18.2.4 Document URL

A URL system should be put in place so that documents can be found directly via URL. Using the path //Document/Index/[DocumentCode] where [DocumentCode] is a user input code, the application should look up the Code to see if it's valid and then either alert the user the code was not found or direct the user to the View page of the item.

#### 18.2.4.1 Example

If the user used the URL //Document/Index/AXFGCA and document ‘AXFGCA’ was a Tag ITR the user should automatically be redirected to the Tag ITR View page //TagITR/[TagITRID]

## 19 Reference Tables

### 19.1 Definition

The Reference Tables contain the “building blocks” of the data in hub2, storing information which is then used in the more complex objects (such as Tags, Punch Lists, etc.) which are described in their own sections later.

### 19.2 Pages

The Reference tables will use the standard search, view and edit pages.

### 19.3 List of Tables

Name of Entity	Level	Definition	Features
Activity	E	<u>Activity</u> within hub2 represents Level 3 in the recommended Work Breakdown Structure and as such exists as the “parent” of Job Cards and as a “child” of Level E. The term “Activity” is often used interchangeably with Work Pack or Work Package, however hub2 treats them as separate but equivalent. The Activity is intended to represent the Planning Component and as such represents a period of time utilised, rather than a physical document.	
Area	C		Table Name can be Aliased
Authorised Person	C	An entry in the <u>Authorised Person</u> reference table represents an individual who is authorised to perform certain activities on a work scope. Within hub2 <u>Authorised Person</u> is used to record information regarding the sign-off of a certification such as an <u>ITR</u> or <u>PWL</u> . Each one can be linked to a user in qedID through the Hub User ID field.	
Cable Type	C	<u>Cable Type</u> defines the different types of <u>Cables</u> available	
Certification Grouping	E	A means by which a collection of ITRs can be associated by <u>Discipline</u> , <u>Subsystem</u> and <u>Level E</u> , the <u>Certification Grouping</u> is an aliased entity (meaning the labels shown on page can be renamed from “Certification Grouping” to something else) that can be used to fill the role of a ‘Discipline Mechanical Completion (DMC)’ field, while allowing project specific naming of that field.	Table Name can be Aliased



Digital Doc Check Box Type	B	For Full Details see the Digital Document Section	
Discipline	B	<p>Perhaps the easiest way to begin to describe a <u>Discipline</u> is to provide some examples of it: Electrical, Mechanical, Safety, Fire &amp; Gas. These represent not only schools of knowledge to which an individual might specialize in, or assume responsibility for, but also categories of equipment or certification.</p> <p>Within hub2 the <u>Discipline</u> will be recorded against items such as tagged equipment (<u>Tags</u>), <u>Punch List Items</u> and Inspection and Test Records (<u>ITRs</u>). This can then be used to filter and subdivide information, as well as to assign permissions and responsibilities to authorised individuals, with the full details of these functions being detailed in the relevant sections.</p>	
Drawing Status	B	<u>Drawing Status</u> defines the Status type of a Drawing.	
Drawing Type	B	Drawing Type defines the Type of the Drawing i.e. P&ID, ISO etc.	
Drawing	C	<u>Drawings</u> can cover a range of different types of illustration, including Isometrics, Process and Instrumentation Diagrams and General Arrangement Drawings amongst others. They serve to communicate information visually in a variety of ways, with the type of drawing used determined both by convention and what is most effective for serving the purpose required.	
Equipment Status	C	Equipment Status can be used to further divide a group of Tags with the same Equipment Type. The purpose of Equipment Status is solely to allow more detailed and refined control over the Equipment Type to ITR allocation/recommendation and as such the field is optional for Tagged Items.	
Equipment Type to ITR	C	Records the allocation of ITRs to Tagged Item based on Equipment Type, as explained in greater detail at the beginning of this section of the document.	
Equipment Type to PWL	C	Records the allocation of PWLs to Tagged Item based on Equipment Type, as explained in greater detail at the beginning of this section of the document.	
Equipment Type	C	<u>Equipment Type</u> provides a way of categorizing <u>Tags</u> based on the type of equipment. This can be useful in determining what type of <u>ITR</u> should be assigned,	



		something that is covered in more detail in the Auto Allocation of Data section.	
Ex Certifying Body	B	Ex Certifying Body represents the certifying body for the Ex Protection type.	Hidden when Ex Feature is disabled
Ex IP Rating	B		Hidden when Ex Feature is disabled
Ex Protections	B	This represents the type of Ex Protection for the Tag.	Hidden when Ex Feature is disabled
Ex Rated Models	B	Represents the Tags Ex Rated Model number.	Hidden when Ex Feature is disabled
Ex Zones	B	A Ex Zone is the area class to which it belonged.	Hidden when Ex Feature is disabled
Gland Types	C	<u>Gland Type</u> defines the types of <u>Glands</u> used to secure <u>Cables</u> to equipment.	
ITR Classes	B	Stores name, Description, Level and Handover Gate, with the latter being the means of associating ITRs to Handovers, via ITR Class.	
ITR	C	<p>Inspection and Test Records (ITRs) are records (traditionally paper-based checklists, but increasingly available digitally) used to certify that tagged equipment has been properly built and tested in line with agreed processes and procedures by approved and competent personnel.</p> <p>The ITRs (also referred to as check sheets, tally sheets and certificates) include a list of tasks, measurements and activities that should be completed to verify the status of the equipment concerned.</p> <p>While the design, content, naming and terminology of ITRs will vary between different companies, locations and projects their ultimate purpose is the same: To ensure the safety of equipment being certified.</p>	
Job Card Status	B	Defines the state of a <u>Job Card</u> and controls whether the Job Card may be locked from editing.	
Location	C	<u>Location</u> represents a physical space. This can be used to record the position (either currently, previously or subsequently) of an object or activity.	
Loop	C	A <u>Loop</u> is an electrical circuit consisting of any number of electronic components. Loops can be associated with <u>Tags</u> or <u>Cables</u> but not any other tag-like object.	



Material Purpose	C	<u>Material Purpose</u> defines the purpose for which a <u>Material</u> will be used during an <u>Operation</u> .	Hidden when Materials Feature is disabled
Material Status	B	<u>Material Status</u> defines the status of a <u>Material</u> during an <u>Operation</u> .	Hidden when Materials Feature is disabled
Material Type	B	<u>Material Type</u> defines the different types of <u>Materials</u> available	Hidden when Materials Feature is disabled
Material	C	A <u>Material</u> is something which can be used in the completion of an item of work (e.g. nuts, bolts, screws).	Hidden when Materials Feature is disabled
MOC Status	B		
MOC Type	C		
Module	C	<p>In general terms a Module represents a construction which contains equipment, however the specific details of exactly what it represents varies between projects and geographic regions, usually complying with one of two schools of thought.</p> <p>One uses Module to refer to Modular Process Skids; frames which contain process systems that are located within a specific Area of a Plant or Facility.</p> <p>The other uses Module to refer to a section of the Plant or Facility (such as "Living Quarters") which is further divided into Areas ("North Block" etc).</p> <p>This can present a challenge in communication, as in one approach a Module is a child of an Area and in the other an Area is the child of a Module.</p> <p>As such it's important that personnel have a full and complete understanding over which terminology is in use on a project.</p>	Table Name can be Aliased
Operation Type	C	<p><u>Operation Type</u> exists to define values that can be used as types of <u>Operation</u>. The purpose of <u>Operation Type</u> is two-fold:</p> <p>Firstly, to allow grouping of <u>Operations</u> into broad categories such as "Disassembly", "Installation", "Documentation", "Clean-Up", "FAT" etc.</p> <p>Secondly as mechanism to select whether the <u>Operations</u> which are of this <u>Operation Type</u> should</p>	Table Name can be Aliased



		be progressed by percentage complete or simply as a Boolean (complete/incomplete) value.	
Parent Tag	C	A Parent Tag is a grouping that can be used either to represent a collection of <u>Tagged Items</u> that are related or that, when taken together, constitute a larger functional object.	
Phases	C	Phases provide a means by which a <u>Level C</u> can be subdivided into distinct periods of time during which work will occur.	Table Name can be Aliased
Preservation Completion Status	B	<p>In literal terms, an entry in the Preservation Completion Status register represents a value that can be recorded against a Tag PWL to represent what state it is in. In a more meaningful sense, each Preservation Completion Status is the answer to the question 'What is the status of the PWL?'</p> <p>Suggested entries for this register would be values such as 'Completed', 'Not Completed', 'Not Required', etc. however it is up to the user to decide, and populate, the Preservation Completion Status register to their satisfaction.</p> <p>Aside from Name and Description, an entry in the Preservation Completion Status register also has values for Is Default and Requires Reason. The former, when set to true, results in the value being set as the default status when signing off a Tag PWL while the latter results in a requirement for an entry in the Tag PWL Comments field before saving can occur. Failure to do so will result in a prompt to the user to complete this information.</p>	Hidden when Preservation Feature is disabled
Primary Handover	E	<u>Primary Handovers</u> are documents mainly used in Brownfield projects to denote when a group of <u>Secondary Handovers</u> (most often representing a complete <u>System</u> ) is ready for 'hand over' (transfer responsibility) from Commissioning to Operations. There are often rules regarding the form in which the <u>Name</u> of the <u>Primary Handover</u> takes.	Table Name can be Aliased
Priority	C	Priorities provide a means by which a <u>Sub System</u> or <u>Secondary Handover</u> can be grouped together into specific tasks that will occur during the same timeframe.	
Procedure Category	B	Procedure Category provide a means by which a <u>Procedure</u> can be grouped together into specific	Table Name can be Aliased



		categories or complexities. Procedure Category can be aliased via the Level A Admin screen.	Hidden when Procedure Feature is disabled
Procedure Completion Status	B	Procedure Completion Status define the different states a Procedure can be in during implementation.	Hidden when Procedure Feature is disabled
Procedure Document Status	B	Procedure Document Status define the different states a Procedure can be in during writing.	Hidden when Procedure Feature is disabled
Procedure Type	B	Procedure Type define the different Types of Procedures.	Hidden when Procedure Feature is disabled
Profession	C	A list of <u>Professions</u> associated with an <u>Authorised Person</u> . This allows an Authorised Person to sign off items in disciplines which are assigned to their professions.	
Project Code	C		
Punch List Item Category	B	Stores details the categories that can be assigned to Punch List Items, as described at the beginning of this section.	
PWL	C		
Secondary Handover	E	A form/grouping mainly used in Brownfield projects to denote a group of <u>ITRs</u> (most often representing a <u>Subsystem</u> ) is ready for 'hand over' (transfer responsibility) from Construction to Commissioning. There is often rules regarding the form in which the <u>Name</u> of the <u>Secondary Handover</u> takes.	Table Name can be Aliased
Service Detail	C		
Service Interval	C		
Skill	C		
Sub System	C	A <u>Subsystem</u> is a functional object that represents a collection of items that serve a common purpose. As with <u>Systems</u> , the items themselves do not have to be physically connected.	
System	C	A <u>System</u> is a functional object that itself is a collection of functional objects ( <u>Subsystems</u> ) that form a network to provide a type of service, or serve a common purpose. It's worth noting that the objects	



		within a <u>System</u> do not have to be physically connected <sup>2</sup> .	
System Group	C	<u>System Group</u> can be aliased in the application using the <u>Level A</u> admin screen. This will mean that the user will no longer see “System Group” for this section or any other reference <u>System Group</u> , and instead it will be known by the alias name.	Table Name can be Aliased
Tag ITR Completion Status	B	<p>In literal terms, an entry in the <u>Tag ITR Completion Status</u> register represents a value that can be recorded against a <u>Tag ITR</u> to represent what state it is in. In a more meaningful sense, each <u>Tag ITR Completion Status</u> is the answer to the question “What is the status of the ITR?” Suggested entries for this register would be values such as “Completed”, “Not Completed”, “Not Required”, etc. however it is up to the user to decide, and populate, the <u>Tag ITR Completion Status</u> register to their satisfaction.</p> <p>Aside from <u>Name</u> and <u>Description</u>, an entry in the <u>Tag ITR Completion Status</u> register also has values for <u>Is Default</u> and <u>Requires Reason</u>. The former, when set to true, results in the value being set as the default status when signing off a <u>Tag ITR</u>, while the latter results in a requirement for an entry in the <u>Tag ITR Comments</u> field before saving can occur. Failure to do so will result in a prompt to the user to complete this information.</p>	On the <u>Tag ITR Completions Status</u> listing only one item can be set to <u>Is Default</u> for each Level. Setting two <u>Tag ITR Completion Status</u> to <u>Is Default</u> will cause a validation warning message to appear.
Test Pack Type	B	Test Pack Types can be used to record a further categorisation of a Test Pack, such as “Leak Test” or “Pressure Test”.	Hidden when Assurance Feature is disabled
Tracker Category	B		Hidden when Assurance Feature is disabled
Tracker Sub Category	B		Hidden when Assurance Feature is disabled
Tracker Type	C		Hidden when Assurance Feature is disabled
Unit of Measure	B	The scale used for a numerical value, e.g. psi (“Pounds per square inch”, a unit of pressure), bar (also a unit of pressure, although deprecated by some professional	

<sup>2</sup> <http://data.posccaezar.org/rdl/RDS316259>



		bodies (Butcher, Crown, & Gentry, 2006)), ft. (“Foot” or “Feet”, an imperial unit of length utilised primarily in the USA), km (kilometres, also a unit of length) etc.	
Vendor	B		
Work Group	C		
Work Pack Completion Status	B	<p>In literal terms, an entry in the <u>Work Pack Completion Status</u> register represents a value that can be recorded against a <u>Work Pack</u> to represent what state it is in. In a more meaningful sense, each <u>Work Pack Completion Status</u> is the answer to the question “What is the status of the Work Pack?” Suggested entries for this register would be values such as “Completed”, “Not Completed”, “Approved”, etc. however it is up to the user to decide, and populate, the <u>Work Pack Completion Status</u> register to their satisfaction.</p> <p>Aside from <u>Name</u> and <u>Description</u>, an entry in the <u>Work Pack Completion Status</u> register also has values for <u>Approved</u>, <u>Locks Work Pack</u> and <u>Requires Reason</u>. The former, when set to true, will mark the Work Pack as having gone through some sort of approval and is ready to be used, the Locks Work Pack will lock certain fields while Require Reason results in a requirement for an entry in the <u>Work Pack Approval Comments</u> field before saving can occur. Failure to do so will result in a prompt to the user to complete this information.</p>	
Work Pack Type	C	Stores the <u>Name</u> , <u>Description</u> , <u>Digital Document</u> association (if applicable) and <u>Level C</u> for a <u>Work Pack Type</u> . Represents a “template” or abstraction of a <u>Work Pack</u> rather than an actual instance.	

### 19.3.1 Authorised Person

#### 19.3.1.1 Definition

An entry in the Authorised Person reference table represents an individual who is authorised to perform certain activities on a work scope. Within hub2 Authorised Person is used to record information regarding the sign-off of a certification such as an ITR or PWL. Each one can be linked to a user in qedID through the Hub User ID field.

#### 19.3.1.2 Permissions

The Authorised Person table has several permissions associated that mean an Authorised Person can only sign off certain items. When an Authorised Person is set up they can choose which items that person will be able to sign off. If the user doesn't have that permission when attempting to sign off an item using that Authorised Person a message will be displayed saying the item cannot be signed off. This will also limit the Authorised Person popups on the Edit pages, and Sign Off Panels to only display Authorised Persons who have the correct permission.

This permission can also be extended to specific Disciplines, this will mean the user will only be able to sign off items that match the Discipline. For example, when signing off ITRs the ITR Discipline must be assigned to a profession which the authorised person is assigned to, or they won't be able to sign off the item.

An Authorised Person can also be linked to a qedID User Account, doing this and using the "User Sign Off" Permission means the user can only sign off items as that Authorised Person. A User must have some level of permission to the Level C to be associated with an Authorised Person from that Level C. To ensure this the popup for Users will only show those users with a permission that applies to the current Level C.

The permission check only applies when signing off an item, if a person who no longer has permission to sign off an item has previously signed off an item, this will not be rechecked. This allows permissions to change over time and for Authorised Persons who have left to have their permissions removed to prevent accidentally signing off as this person.

An Authorised Person can also be set to inactive, this will have the same effect as if the user doesn't have permission to that section, they will be unable to sign off any items that require permissions and won't appear in the popups.

#### 19.3.1.3 Signatures

If Authorised Person Signatures are enabled on the current Level C, it will be possible to upload a signature image against an Authorised Person. This image will then be automatically added to any Digital Documents the Authorised Person has signed off when they are generated in PDF format. The image will be resized as required, but it is recommended the image dimensions are close to a 3:1 ratio (e.g. 390 x 130 pixels).



## 20 Tagged Items

### 20.1 Definition

In hub2 there are several different entities that may be associated with a ‘tag number’ (a number that uniquely represents something within an Asset or Facility). Each of these entities will have their own set of fields but all will also be linked to a Tagged Item record, which contains fields shared between all types.

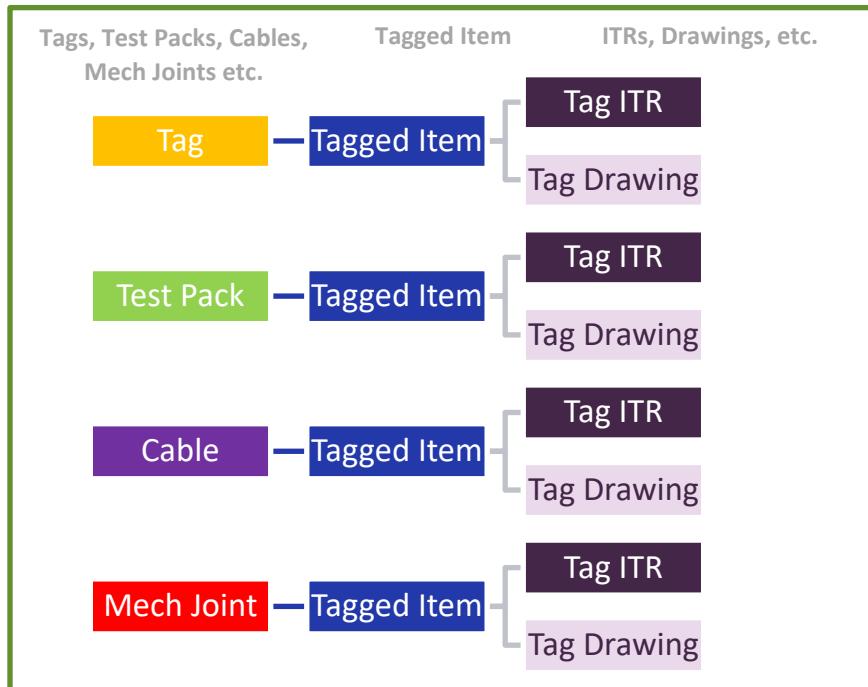


Figure 36. This diagram shows how each tagged-item Entity is different, however all feature a connection to their own Tagged Item, which hosts common fields and allows connections to other entities.

The Tagged Item records serves two important purposes: (What is Figure 1 and Figure 2?)

Figure 1. To provide a common link between Tagged Items and associated entities such as Tag ITRs, Tag Drawings and Tag Subsystems

Figure 2. To provide common fields such as Number and Description.

By using this combination, it is possible for each type of item to have their own bespoke field set while also allowing reporting to encompass all entities which have a link to a Tagged Item.

**It's important to note** that users will have no awareness of Tagged Items as they will integrate seamlessly with their parent tagged-it (is this clear ?)

Each of the entities that links to Tagged Item has its own section within this document, however for convenience a listing of each, alongside a brief description, is provided below:

Name	Description
Cable	A length of conductive material encased in protective covering, used to distribute electricity.
Line	A length of piping.
Mechanical Joint	A connection between two pipe lines that may also redirect the flow in another direction.
Spool	A prefabricated pipe-fitting.
Tag	Generally, an item of equipment.
Test Pack	A set of documentation that describes a segment of a piping system to be tested.

Table 29. A listing of tagged-item types. Table in previous section does not have Table number

## 20.2 Additional Functionality

### 20.2.1 Linked Tables

Tagged Item also allow multiple Sub Systems, Drawings and Procedures to be associated with them. These can be edited via any of the Tagged Items edit page using the standard multi-entity form.

### 20.2.2 Searching Tagged Items

The “All Tagged Items” search page will allow users to search for all existing Tagged Items which have a linked Tagged Item. The search filter fields will include every field directly related to the Tagged Item, and to any of the Tagged-item entities.

The standard Saved and Recent search options will be available to the user for this search.

There will be **no Export** option on the search results, due to the search results potentially containing different Tagged-item entities which would have different exports formats.

The Name field in the search results grid will link to the appropriate Tagged Items View page, rather than a generic Tagged Item View page.

## 20.3 Validation & Business Rules

- Tags must have at least one entry into the Tag Subsystems table.
- The Tag Drawings table cannot have the source drawing added to it twice. If a Drawing is the source drawing, then it cannot also be added to the table as in example below.



## 21 Tag

### 21.1 Definition

In hub2 a Tag is a type of tagged-item that represents functionality provided by physical equipment within a facility, with the nomenclature arising from the equipment tag assigned (and usually physically attached) to the equipment for identification purposes. While this does mean that, taken literally, the tag is the label itself, it is usually used to refer to the function of the equipment.

It should be noted that if a piece of equipment, or part of a piece of equipment, is replaced this does not constitute a different tag. Therefore, if Tag 'A' was a compressor with the Serial Number '0001' and it was down and was replaced with compressor with serial number '0002', it would still be Tag 'A'.

### 21.2 Additional Functionality

#### 21.2.1 Linked Tables

Tags also allow multiple Lines and Service Details to be associated with them. Much like the Sub Systems these can be edited via the Tag edit page using the standard multi-entity form.

#### 21.2.2 Additional Exports

The Export Button will have the following extra options in the drop down next to it to allow additional exports from this page

- Tagged Item Drawings – Export of the relationship between Tags and Drawings
- Tagged Item ITR – The Tag ITR Export but for the currently selected/searched Tags
- Tagged Item Procedure – Export of the relationship between Tags and Procedures
- Tagged Item PWL – The Tag PWL Export but for the currently selected/searched Tags
- Tag Lines – Export of the relationship between Tags and Lines
- Tag Service Details – Export of the relationship between Tags and Service Details

The export uses the normal export selection rules so if any searches are active then only Tagged Item child items from the search results will be used, and if the user has selected some items then only those Tagged Item child items will be exported. These exports can only be downloaded in XLSX Format.

### 21.3 Validation & Business Rules

Tag must follow the same Validation rules as the Tagged Item.

In addition, Tags must follow these additional Validation Rules

- Ex Related fields may not be set on a non Ex Tag
- Loop & Loop Element fields:
  - Loop Element cannot be set without Loop



## 22 Cable

### 22.1 Definition

#### 22.1.1 Cables

In simple terms Cables are collections of one or more lengths of electrically conductive materials that are contained within protective and non-conductive coatings. The coatings are commonly known as 'Sheaths'. Each conductive-material-and-Sheath combination is known as a Core.

It is possible that a cable may contain only a single Core, however it is more likely that it will comprise multiple Cores contained within an additional overall Sheath.

### 22.2 Additional Functionality

#### 22.2.1 Additional Exports

The Export Button will have the following extra options in the drop down next to it to allow additional exports from this page

- Tagged Item Drawings – Export of the relationship between Cables and Drawings
- Tagged Item ITR – The Tag ITR Export but for the currently selected/searched Cables
- Tagged Item Procedure – Export of the relationship between Cables and Procedures
- Tagged Item PWL – The Tag PWL Export but for the currently selected/searched Cables

The export uses the normal export selection rules so if any searches are active then only Cable child items from the search results will be used, and if the user has selected some items then only those Cable child items will be exported. These exports will only be available in XLSX Format.

### 22.3 Validation & Business Rules

Cable must follow the same Validation rules as the Tagged Item.

In addition, Cables must follow these additional Validation Rules

- Cable From and Cable To cannot be set to the same Tag.
- Pulled Length cannot be set without setting Pulled Length Unit and vice versa.
- Loop & Loop Element fields:
  - Loop Element cannot be set without Loop

## 23 Piping Tags

### 23.1 Definition

#### 23.1.1 Line

A Line is defined as a section of pipe. Lines can be connected via Spools; a short section of pipe with fittings that allow one pipe line to connect to another. Like Spools, Lines can also be part of a Test Pack.

#### 23.1.2 Spool

A short, prefabricated section of pipe, with fittings, that allow one pipe line to connect to another (possibly of different size).

The fittings can include items such as Flanges (a plate or ring at the end of a pipe), Elbows (used to change the direction of the pipe) and Tees (three pipe connectors in a T shape), amongst others

#### 23.1.3 Mechanical Joint

A connection established between two sections of pipe, using nuts and bolts. Factors such as the material used are critical in establishing the required tool and amount of force used to adjust the nuts on joints, to ensure that no leak can occur, and that the nuts and bolts are not under undue stress. Failure of a mechanical joint could cause the fluid inside to leak. If this were a hydrocarbon (oil) then the results could have serious consequences.

#### 23.1.4 Test Pack

Test Packs are a compilation of the discipline engineering documentation required to fabricate, assemble, inspect and test a defined discrete scope. This document is concerned with Piping Test Packs, which will be referred to as Test Packs throughout. Any other types of Test Pack are not covered in this document. Test Packs are used to check if piping systems have been installed correctly. Each Line in a system has a Test Pack number associated with it.

A Test Pack itself is a dossier that fully describes the testing of a pipeline or sections of a pipeline and may include such items as calibration information and the appropriate drawings, covering both layout and the appearance of the piping itself.

After a piping system has been tested and the results found satisfactory, a certificate is included in the Test Pack that is signed off by authorised personnel indicating that the system has been verified. On completion of the test, the ITRs are signed off and the Test Pack becomes a part of the Handover scope.

In hub2 Test Packs are treated as a tagged object specifically for Piping, and as such have additional fields related to piping and the tests which may be performed on pipes during the commissioning and completion of a system. As they are treated as a tagged object, the functionality to link a Test Pack to Subsystems, assign ITRs and even PWLs is possible if required.

## 23.2 Additional Functionality

### 23.2.1 Linked Tables

Test Packs also allow multiple Lines, Mechanical Joints and Spools to be associated with them. Much like the Sub Systems these can be edited via the Test Pack edit page using the standard multi-entity form.

### 23.2.2 Additional Exports

The Export Button will have the following extra options in the drop down next to it to allow additional exports from this page

- Tagged Item Drawings – Export of the relationship between Piping Tag and Drawings
- Tagged Item ITR – The Tag ITR Export but for the currently selected/searched Piping Tags
- Tagged Item Procedure – Export of the relationship between Piping Tags and Procedures
- Tagged Item PWL – The Tag PWL Export but for the currently selected/searched Piping Tags

In addition, the Test Pack page will have the following additional Exports

- Test Pack Lines – Export of the relationship between Test Packs and Lines
- Test Pack Spools – Export of the relationship between Test Packs and Spools
- Test Pack Mechanical Joints – Export of the relationship between Test Packs and Mechanical Joints

The export uses the normal export selection rules so if any searches are active then only Cable child items from the search results will be used, and if the user has selected some items then only those Cable child items will be exported. These exports will only be available in XLSX Format

### 23.3 Validation & Business Rules

Lines, Spools and Mechanical Joints have the same validation rules as Tagged Item.

In addition, the following rules apply to Test Packs

- Completed By and Completed Date must be populated concurrently.
- Completed Date must not be set in the future.
- Completed By must be by an Authorised Person who has the “Sign Off Test Packs” permission
- Completed By must be by an Authorised Person who is assigned a Profession which contains the same Discipline as the Discipline of the Test Pack.



## 24 Tag ITR

### 24.1 Definition

Tag ITRs represent an actual instance of an ITR (a check sheet used to record test results) assigned to a tagged-item (such as a Tag, which represents a piece of equipment, or a Test Pack which is a dossier of information representing a section of pipework to be tested).

To explain this; imagine a project which has a type of ITR called QED-E01A (an Electrical Check Sheet). When a user assigns an E01A type ITR to a Tag then a new Tag ITR is created. If the user were to mark it as complete, that Tag ITR would be updated, and if the user were to remove it then the Tag ITR would be deleted. None of this would affect that actual ITR itself, no matter what, QED-E01As would still be available to assign to Tags.

As such it may be easier to think of the ITR Entity (which is described in section 14 ITR) as the “library” of available Inspection and Test Records, with the Tag ITRs being the actual assigned instances.

### 24.2 Additional Functionality

#### 24.2.1 Sign Off

Tag ITRs make use of the Flexible Sign Off functionality. The available Sign Offs for each Tag ITR will be based on the Sign Offs configured at the ITR Level. Once a Tag ITR has been signed off it's available sign offs cannot be changed unless all sign offs are cleared.

When the Completed Sign Off is set for a Tag ITR the Tag ITR will be deemed complete and the Tag ITR Completion Status will be set to the default status. This can be changed from the edit screen. It is not possible to sign off a Tag ITR using the Sign Off Panels unless a default completion status is set.

#### 24.2.2 Digital Documents

Tag ITRs can have a Digital Document, that is primarily used to create an electronic version of the check sheet required to complete a Tag ITR. The Digital Document can be configured using the Digital Document section via the ITR Reference Table. The Tag ITR Digital Document can then be generated from the search page or it can be viewed/generated via the Digital Document Panel on the View screen.

#### 24.2.3 Generate

The “Generate” button will attempt to generate the selected Tag ITR via the appropriate generation method. ITR records which have the Generation Method field set to ‘Template’ will attempt to generate DOCX files, if there is a DOTX template stored for the ITR. ITRs with the Generation Method field set to ‘Digital Document’ will attempt to generate a PDF if there has been a Digital Document created.

For Tag ITRs where the ITR Generation Method field is set to ‘DOTX Template’, a warning message will be shown to the user if no matching DOTX template file can be found to use in the generation.

For Tag ITRs where the ITR Generation Method field is set to ‘Digital Document’, a warning message will be shown to the user if there has not been a Digital Document created.



#### 24.2.4 Multi Tag ITRs

The Multi Tag ITRs are used for generating a Tag ITR template which contain more than one Tag ITR in a single document. These are designed to allow multiple checks to be performed at once and reduce paperwork.

To set a Tag ITR as available for Multi Tag ITR Generation the Tag must be flagged as “Is Multi” on the ITR Reference Table.

Only Tag ITRs within the same Sub System can be generated into a single document, as such the Sub System field is required when searching Multi Tag ITRs.

##### 24.2.4.1 Generate

The “Generate” button will attempt to generate the selected Tag ITR into a single Multi Tag ITR. The document will be based on the template uploaded and will generate in much the same way as a normal Tag ITR but all the fields will be filled in with a Comma Separated List (CSL) of all the values from the multiple Tags e.g. Normally the Bookmark for Tag Name would populate the single Tag name for the selected Tag ITR, but since multiple Tags can be selected at once all the Tags names will appear but split out by a comma.

Multi Tag ITRs can only be Generated as a DOTX Template.

### 24.3 Validation & Business Rules

The following Validation Rules must be met

- If the chosen Tag ITR Completion Status Requires Reason has a value of true, then the Tag ITR Comments must be filled in.
- Sign Off's Date fields cannot be in the future; this will depend on the Time Zone set. The Date in the current Time Zone will be used to work out the current date, items cannot be signed off after this date.
- Assigned To and the Sign Offs By must be by an Authorised Person who has the “Sign Off Tag ITRs” permission.
- Assigned To and the Sign Offs By must be by an Authorised Person who is assigned a Profession which contains the same Discipline as the Discipline of the ITR.
- Sign Offs must be completed in order, meaning a Sign Off with Order 1 cannot be populated with a date which is in the future of the Sign Off with Order 2
- Sign Offs of type “Required” must be populated when saving the Sign Off of Type “Complete”



## 25 Punch List & Punch List Item

### 25.1 Definition

Punch Lists Items are used to record items of outstanding work which should have been completed previously. This could include examples such as missing insulation or trace heating on pipework, painting not complete or paint touch-ups required, outstanding earthing of instruments or junction boxes, amongst many others. Each of these examples could be raised as a Punch List Item (PLI). A Punch List is a grouping of Punch List Items.

Within hub2 there are two distinct methods for tracking PLIs; through either Two-Tier or One-Tier Punch Lists.

In Two-Tier mode, multiple Punch Lists (PLs) can be created with Punch List Items (PLIs) assigned to each PL.

In One-Tier mode there is only a single master PL to which all PLIs are assigned.

Mode	No of PLs	No of PLIs	Relationship between PL and PLIs
One-Tier	1	Many. Raised as required by users.	All PLIs belong to single master PL.
Two-Tier	Many. Raised as required by users.	Many. Raised as required by users.	PLIs can be assigned to any PL.

Table 30. Comparison of One-Tier and Two-Tier Punch List modes.

Punch List Items are assigned a Punch List Category which is usually used to indicate the severity of the defect. A common, and simple, arrangement is to create two Punch List Item Categories, one with the Name "A" and one with the Name "B". Category "A" is used for safety related defects, while "B" is used for others.

The ability to define Punch List Item Categories is however completely at the discretion of the user and so may deviate completely from the above example, which is provided for general information only and does not constitute guidance on this subject.

Punch List Items also have a Scope. This Scope denotes what type of Entity the Punch List Item refers to, with the following values available:

- Subsystem
- Tag
- Tag ITR
- No Scope

When a PLI is considered complete by the person responsible for undertaking the work it is reported as 'Cleared'. After this, if it is agreed by the responsible parties that the item is complete and requires no further action it is 'Accepted'.

### 25.2 Additional Functionality

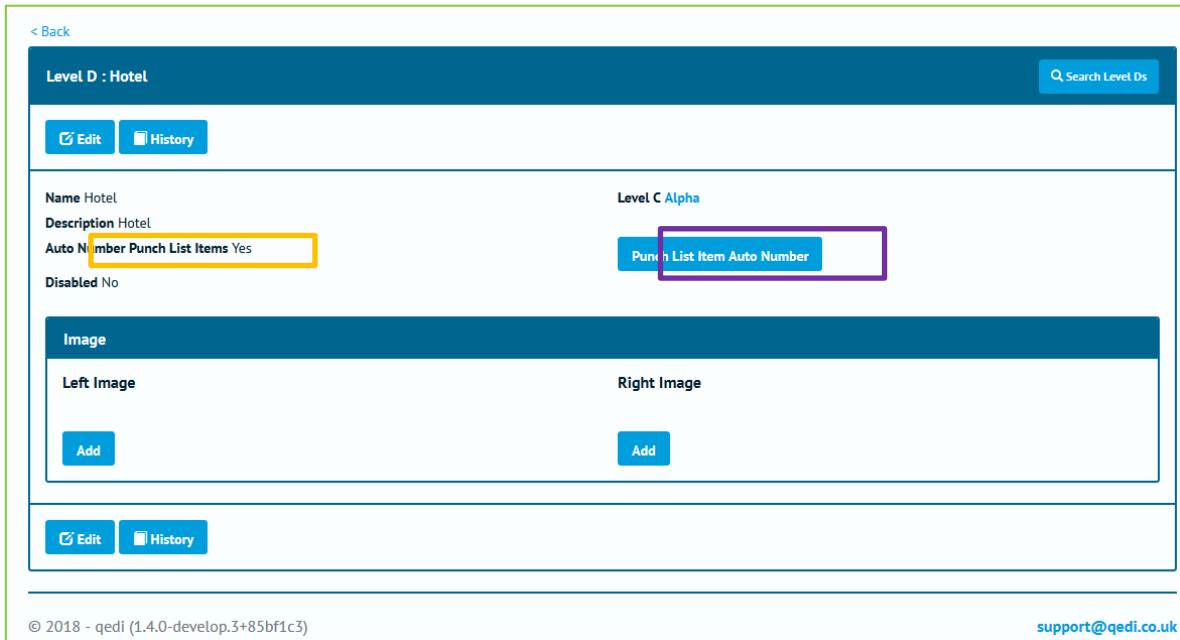


## 25.2.1 Auto Number Punch List Items

When enabled the “Auto Number Punch List Items” feature provides several options for managing the consistency of Punch List Numbers, based around a schema defined in the Level D Admin section.

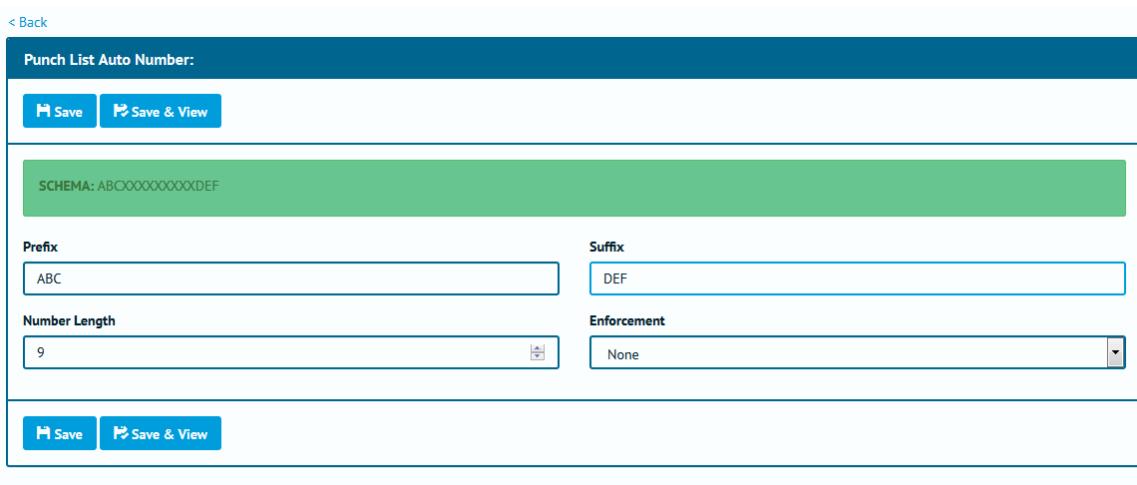
### 25.2.1.1 Defining the Schema

The Auto Number Punch List Item schema is defined at Level D, via the Level D Admin pages. To define the Schema the feature first must be enabled. Once this has been completed a new option will appear on the view page for the Level D.



This screenshot shows the 'Level D : Hotel' view page. At the top, there are 'Edit' and 'History' buttons. Below that, the 'Name' field contains 'Hotel'. The 'Description' field contains 'Hotel'. The 'Auto Number Punch List Items' field is set to 'Yes' and is highlighted with an orange border. The 'Disabled' field is set to 'No'. On the right side, under 'Level C Alpha', there is a 'Punch List Item Auto Number' button, which is highlighted with a purple border. Below this, there is a 'Image' section with 'Left Image' and 'Right Image' fields, each with an 'Add' button. At the bottom, there are 'Edit' and 'History' buttons again, and the copyright notice '© 2018 - qedi (1.4.0-develop.3+85bf1c3)' and support email 'support@qedico.uk'.

Figure 37. Screenshot of the Level D view page, showing the Auto Number Punch List Items feature is enabled (highlighted in orange) and the button used to enter the Schema Configuration page highlighted in purple.



This screenshot shows the 'Punch List Auto Number:' configuration page. At the top, there are 'Save' and 'Save & View' buttons. Below that, a green bar displays the 'SCHEMA: ABCXXXXXXXXXDEF'. Underneath, there are two input fields: 'Prefix' containing 'ABC' and 'Suffix' containing 'DEF'. There is also a 'Number Length' input field set to '9' and an 'Enforcement' dropdown menu set to 'None'. At the bottom, there are 'Save' and 'Save & View' buttons again, and the copyright notice '© 2018 - qedi (1.4.0-develop.3+85bf1c3)' and support email 'support@qedico.uk'.

Figure 38. Screenshot of the Auto Number Punch List Items Schema Configuration page.

The following Schema elements can be configured:

Element	Description
Prefix	Text that will appear at the start of the Punch List Item Number.
Suffix	Text that will appear at the end of the Punch List Item.
Number Length	The number of digits that will appear in the Punch List Item number.

Table 31. Listing of Auto Number Punch List Item Schema elements.

For example, with a Prefix of ABC, a Suffix of DEF and a Number Length of 9, the Schema would begin at ABC000000001DEF and end at ABC999999999DEF.

Once the “maximum” number has been reached it will not be possible to add any more Punch List Items until the schema is altered. This is true even if existing Punch List Items are removed.

#### 25.2.1.2 Enforcement Options

**Note:** In all cases the Number must adhere to normal validation rules (e.g. does not exceed maximum length, does not use restricted characters, etc.)

Auto Number Punch List Items	Enforcement	Effect On Punch List Creation
Disabled	N/A	The Number field is blank and must be populated by the user. There are no additional restrictions.
Enabled	None	The Number field is populated based on the defined schema but can be overwritten with any value.
Enabled	Format Only	The Number field is populated based on the defined schema and can only be overwritten by a value using the same format.
Enabled	Strict	The Number field is populated based on the defined schema and cannot be overwritten.

Table 32. Listing of Auto Number Punch List Items options.

#### 25.2.1.3 Adding a Punch List Item

When Auto Numbering is enabled the Number field on the Punch List Item Add page will be labelled “Provisional Number” and populated with the next possible number in the sequence (according to the schema defined at Level D.) In two-tier mode, this will be the next number within the Punch List itself.

When operating in Strict Mode the Number field will still show a Provisional Number but the field will be read-only since the user cannot change the Number.



Should the provisional auto-number become unavailable before the Punch List Item is saved (e.g. two people try to raise a new Punch List Item under the same scope at the same time, but one user presses Save before the other), the next number in the sequence will be used, and a message will be displayed, informing the user “Number changed from Provisional Number X to Y”.

If the user changes the value then the field will revert to using the label “Number”.

### 25.2.2 Scoping a Punch List

For Punch List Items there are a couple of ways to link to some fields due to the fact Punch List Items can be “scoped” at different levels.

For example, a Punch List Item can be directly associated with a Sub System or it could be associated with a Tagged Item which has an association with a Sub System.

To set the scope of a Punch List the user must first select the Level they wish to scope the Item to (Sub System, Tag etc.) then after selecting this a standard textbox will appear allowing the user to select the correct item. If the user selects Tag ITR, the textbox will be read-only and the user will have to use the popup to select the Tag ITR.

When viewing or reporting on Punch List Items, hub2 will include each Item within the correct System or Sub System depending on the item’s Scope based on the table below

Report Level	System Used
<b>System</b>	<u>Sub System -&gt; System: Name</u> <u>Tagged Item -&gt; Tag Sub Systems -&gt; Sub System -&gt; System: Name</u> <u>Tag ITR -&gt; Tagged Item -&gt; Tag Sub Systems -&gt; Sub System -&gt; System: Name</u>
<b>Subsystem</b>	<u>Sub System: Name</u> <u>Tagged Item -&gt; Tag Sub Systems -&gt; Sub System: Name</u> <u>Tag ITR -&gt; Tagged Item -&gt; Tag Sub Systems -&gt; Sub System: Name</u>

When the user searches for a given Sub System they may wish to find all items **directly** associated with that Sub System or associated with that Sub System **via** the Tagged Item.

Below is a table of fields which search via multiple different fields.

Field	Paths
<b>System</b>	<u>Sub System -&gt; System: Name</u> <u>Tagged Item -&gt; Tag Sub Systems -&gt; Sub System -&gt; System: Name</u> <u>Tag ITR -&gt; Tagged Item -&gt; Tag Sub Systems -&gt; Sub System -&gt; System: Name</u>
<b>Sub System</b>	<u>Sub System: Name</u> <u>Tagged Item -&gt; Tag Sub Systems -&gt; Sub System: Name</u> <u>Tag ITR -&gt; Tagged Item -&gt; Tag Sub Systems -&gt; Sub System: Name</u>

<b>Tag</b>	<u>Tagged Item: Name</u> <u>Tag ITR -&gt; Tagged Item: Name</u>
<b>ITR</b>	<u>Tag ITR -&gt; ITR: Name</u>
<b>Test Reference</b>	<u>Tag ITR: Test Reference</u>

Table 33. **Search Fields with Multiple Paths on Punch List Item Search page**

## 25.3 Validation & Business Rules

### 25.3.1 Punch List Item

The following Validation Rules must be met

- Any Sign Off's By and Date fields must be populated at the same time.
- Any Sign Off's Date field cannot be in the future. The time zone set for Level E will be used to work out the current date. Items cannot be signed off after this date.
- Assigned To, and Sign Offs must be an Authorised Person who has the "Sign Off Punch Lists" permission
- Assigned To, and Sign Offs must be an Authorised Person who is assigned a Profession which contains the same Discipline as the Discipline of the Punch List Item.
- Sign Offs must be completed in order, meaning a Sign Off with Order 1 cannot be populated with a date which is in the future of the Sign Off with Order 2.
- Sign Offs of type Required must be populated when saving the Sign Off of Type Complete.

### 25.3.2 Auto Punch List Item

The following rules only apply if Auto Punch List Items is turned on and the Enforcement is not set to None.

If the 'maximum' number for the Auto Punch List Item numbering has been reached (for example the Number Length has been set to 4 and a Punch List Item with the Number '9999' exists) then it will not be possible to generate a new Number automatically, even if preceding numbers have been removed (e.g. Punch List Item '9999' exists but '9998' does not, meaning there is a free number but it is less than the highest number raised).

To proceed with raising a new PLI in this scenario, the user must manually enter an available Number or change the schema rules.

It should be noted that any changes to the schema will result in existing PLI Numbers being ignored when generating new auto-numbers, unless they are updated to match the new schema. This includes increasing the length of the number component, as it makes up part of the schema.

### 25.3.3 Punch List Item Category

- Punch List Item Category must have at least one Sign Off.
- Punch List Item Category must have one Sign Off of Sign Off Type: Complete.



## 26 Management of Change

### 26.1 Definition

Management of Change is the process by which potential deviations from original scope/design are tracked.

The MOC section may record queries being raised by site personnel about deviations (e.g. if a piece of equipment is different than expected) or instructions from the site (e.g. expect the equipment to be different).

It's essential that any such information is recorded for reasons of safety and efficiency, as not properly bringing these issues to attention could have hazardous consequences.

#### 26.1.1 Queries

POSC Caesar lists what is referred to above as queries as 'Change Requests' and defines them as follows (POSC Caesar Association, 1996):

"A request made by user of data (other than engineering user) for changes to original process plant design due to errors, omissions, and or other reasons (e.g., new requirements). A request is followed by review, analysis, and approval. Change requests are tracked in terms of cost and schedule (a kind of mini project within project). Change requests may originate from construction or operations, for example. Changes requests may be made against: supplier list; process; plant, procedure; design basis."

## 26.2 Additional Functionality

### 26.2.1 Link to Multiple Sections

An MOC Item can be linked to multiple different entities throughout the application i.e. System, Sub System, Job Card etc. These links define the Scope of the MOC i.e. this management of change effects these Systems.

The following is a list of all the entities that an MOC can be linked to:

- Disciplines
- Tagged Items
- System
- Sub System
- Primary Handover
- Secondary Handover
- Area
- Module
- Work Pack
- Job Cards

These links can be edited on the MOC Edit page using the standard multi-entry form.



### 26.2.2 Flexible Sign Offs

MOCs make use of the Flexible Sign Off functionality. The available Sign Offs for each MOC will be based on the Sign Offs configured on its associated MOC Type. Once a MOC has been signed off, its available sign offs cannot be changed unless all sign offs are cleared.

### 26.2.3 Generation

Attempting to Generate an MOC will create an MOC Document via the DOTX generation method. The template used will be the DOTX template attached to the MOC Type associated with the MOC. A warning message will be shown to the user if no matching DOTX template file can be found to use in the generation.

## 26.3 Validation and Business Rules

### 26.3.1 MOCs

- Parent MOC cannot be the same as the current MOC or any of the MOC's children.
- Sign Off's By and Date fields must be populated at the same time.
- Sign Off's Date field cannot be in the future. The time zone set for Level E will be used to work out the current date. Items cannot be signed off after this date.
- Assigned To, and Sign Offs must be an Authorised Person who has the "Sign Off MOCs" permission
- Sign Offs must be completed in order, meaning a Sign Off with Order 1 cannot be populated with a date which is in the future of the Sign Off with Order 2.
- Sign Offs of type Required must be populated when saving the Sign Off of Type Complete.

### 26.3.2 MOC Type

- MOC Type must have at least one Sign Off.
- MOC Type must have one Sign Off of Sign Off Type: Complete.



## 27 Planning

### 27.1 Definition

#### 27.1.1 Work Pack

Work Packs (also called Work Packages, Construction Work Packs and Construction Work Packages) are the lowest level represented on a project's Work Breakdown Structure (WBS) and are used as a way of grouping tasks within a Work Scope (which, when following recommended data population guidelines, maps to Level E of the hub2 data structure).

In a literal sense, a Work Pack is a collection of documents necessary for the completion of a group of tasks within the timescale specified in the Project plan. This will include the Tasks to be completed and the Equipment and Materials required to complete them.

#### 27.1.2 Job Cards

Job Cards (also known as Job Packs) represent a further subdivision of Work Packs and detail jobs to be undertaken at a facility. They exist to authorise and instruct the workers to perform the listed task and contain task guidelines, safety information and other relevant documentation such as inspection procedures and drawings.

## 27.2 Additional Functionality

### 27.2.1 Additional Exports

The Job Card Export menu allows for the exporting of Job Card Drawings associated with the Job Card in XLSX Format. The option is available under the Export menu on the Job Card search.

The export uses the normal export selection rules so if any searches are active then only Job Card Drawings from the search results will be used, and if the user has selected some items then only those Job Card Drawings will be exported.

### 27.2.2 Sign Offs

#### 27.2.2.1 Work Pack

The Work Pack implement the Flexible Sign Off. The sign offs available for each Work Pack will be set via it's Work Pack Type. A sign off panel will be available for each sign off at the top of the Work Pack View screen.

Work Packs make use of the Flexible Sign Off functionality. The available Sign Offs for each Work Packs will be based on the Sign Offs configured at the Work Pack Type Level. Once a Work Pack has been signed off it's available sign offs cannot be changed unless all sign offs are cleared.

#### 27.2.2.2 Job Card

Job Cards have two sign offs (Signed Off and Accepted). Both sign offs will have a Sign Off Panel at the top of the Job Card View screen.



### 27.2.3 Work Pack Digital Documents

Work Packs can have a Digital Document, that is primarily used for the final checklist when signing off a Work Pack. The Digital Document can be configured using the Digital Document section via the Work Pack Type. The Work Pack Digital Document can then be generated from the Work Pack search page or it can be viewed/generated via the Digital Document Panel on the Work Pack View screen.

### 27.2.4 Work Pack Approvals

Each Work Pack may contain a set of Approvals which provide a way to record the fact that an Authorised Person has checked the Work Pack and indicated that they are happy with the document at that time. Approvals are organised into Rounds such that if the same Approval is present in multiple rounds, earlier Approvals must be signed off before later ones. Each Approval can optionally be associated with a Discipline, however only one Approval of each Discipline is allowed per round. For example, a Work Pack with two Approval Rounds would require an Electrical Approval at Round 1 to be completed before an Electrical Approval at Round 2.

### 27.2.5 Locking a Work Pack or Job Card

A Work Pack can be locked based on the Work Pack Completion Status. A Work Pack Completion Status has an option for “Locks Work Pack”. When this option is selected, and a Work Pack is set to have this status some actions may not be performed on the Work Pack. The same functionality exists for Job Cards and is based on the Job Card Status table.

Locked Work Packs or Job Cards lock all the functionality for any Job Cards or Operations under the locked item except the following functionality.

#### Work Pack

- Reordering the Attachment
- Generating/Editing the Digital Document
- Work Pack Completion Status
- Approval Comments
- Assigned To and Date
- Sign Off Fields (Flexible Sign Offs)
- Rejection Reason

#### Job Card

- Assigned To and Date
- Job Card Comments
- Signed Off By and Date
- Accepted By and Date

#### Operations

- Is Complete / Percentage Complete



## 27.2.6 Generating Work Pack Documentation

### 27.2.6.1 Generating a Full Work Pack

Generating the full Work Pack documentation in PDF format can be performed using the buttons available in the Document Generate Panel on the Work Pack view page.

This will produce a PDF file with the:

- Work Pack Cover Sheet
- Work Pack's Attachments,
- Job Card Attachments
- Job Card Drawings
- Work Pack's Digital Document

The Documents will be generated in the order above, but this can be configured using the Reordering page.

Due to the time it takes to generate this document, selecting Generate will launch a background process that will send an alert to the user once the document is completed. Once the document has been generated once it can be downloaded at anytime using the Download button from the same Panel.

To regenerate the document, the existing copy must be deleted from the Document Generate Panel first.

Only files stored in PDF format will be included in the merged file.

### 27.2.6.2 Reordering Page

The reordering page allows the documents that will be generated into the Full Work Pack Document to be ordered. Clicking on the “Reorder Attachment” button will launch a new page that will list all Attachments that will be included in the Document except for the Cover Sheet (which will always be first) and the Work Pack's Digital Document (which will always be last).

On the reorder page, each Attachment can be dragged and dropped into the correct order, and that order can be saved for when the document is generated.

The following table highlights the functionality available on the reorder screen.

UI Element/Field	Type	Description/Path	User Restrictions	Feature Restrictions
	Drag and Drop	Allows the Dragging and Dropping of Drawings or Attachments in the correct order	None	None
Save	Button	Saves the new order and remains on the Reorder page	None	None
Save & Return	Button	Saves the new order and returns to the Work Pack or Job Card View page	None	None

Table 34. Details on the UI Functionality of the Reorder page



### 27.2.7 Job Card Progress Bar

A progress bar is shown at the top of the Job Card screen, this progress bar shows the overall Percentage complete of the Job Card based on the progress of each of the Operations.

The Percentage complete is worked out via the above calculation for the Job Cards Operations

$$\frac{\sum \% \text{ Complete} / 100 * \text{Weighting}}{\sum \text{Weighting}} * 100$$

\* If the Operation has a checkbox “Is Complete” the Operation is considered 100% complete when checked, and 0% complete when unchecked

#### 27.2.7.1 Understanding the Formulaa

1. We need to know how far through we are with each Operation, operations can have a Percentage complete or an Is Complete field. When we see Is Complete we treat this as 100% complete.
2. We take each of these percentages complete for each Operation and divide by 100, to get a decimal number <= 1 i.e. If an Operation is 100% complete we would get 1. If it was 25% complete we would get 0.25.
3. We take each of these decimal numbers and multiply by each Operation’s own Weighting.
4. We Sum all the “Operations % Weightings” together
5. We then take a sum of all the Operations Weightings (without multiplying by the % Complete)
6. We take the answer to part 4 (Sum of Operation % Weighting) and divide by the answer to part 5 (Sum of Operation Weightings).
7. We turn that answer into a % (multiplye by 100)

### 27.2.8 Operation Alias

Operation can be aliased in the application using the Level A admin screen. This will mean that the user will no longer see “Operation” for this section or any other reference to Operation, and instead it will be known by the alias name.

### 27.2.9 Operation Progress Method

When configuring Operation Type the user can select the “Operation Progress Method” for the Operation. This field is a Dropdown and can have either Checkbox or Percentage value. Based on this field, Operations of this Operation Type have either Is Complete (Checkbox option) or Percent Complete (Percentage option) field. The UI dynamically displays only the corresponding field, but on Imports and API both fields are available and can be used to update the value. If the Operation Progress Method is Checkbox and the Percent Complete field is used, only 0 and 100 are accepted values.

### 27.2.10 Operation Material

Operation Materials allow the assignment of Materials that are required to complete the item of work defined in the Operation. The size and quantity of the Material can be specified, along with its intended purpose and its status.

Operation Materials can be deleted using the Delete button on their own Edit page, or from the Operation Materials grid on the Operation View page.



## 27.3 Validation & Business Rules

### 27.3.1 Work Pack

- When the Work Pack Completion Status is set to a Status that has Requires Reason selected then the Approval Comments must be populated.
- Assigned To must be an Authorised Person who has the “Sign Off Work Packs” permission.
- If a Work Pack is assigned a Work Pack Status which has Locks Work Pack set to true, then no fields on Work Pack apart from the Status, Assigned To, Assigned Date, Signed Off By, Signed Off Date may be changed until either the Status has been removed or the Work Pack is unlocked.

### 27.3.2 Work Pack Approvals

- There can only be one Approval per Discipline in each Round on a Work Pack
- The Name of each Approval must be unique within each Round on a Work Pack
- When the Work Pack is locked, no changes can be made to Approvals
- Matching Approvals in earlier Rounds must be signed off before ones in later Rounds. An Approval will be considered a match by the following rules:
  - If the Approval has a Discipline, then it will be compared to other Rounds by Discipline
  - If the Approval does not have a Discipline, then it will be compared by name
  - The Approved By Authorised Person must have Sign Off Work Pack Approvals set, and if the Approval has a Discipline, must have a Profession with that Discipline
  - Approval Rounds within a Work Pack must start at 1 and count upwards consecutively with no gaps

### 27.3.3 Job Card

- Start Date must be on or before End Date.
- End Date must be on or after Start Date.
- Assigned To must be an Authorised Person who has the “Assign” permission
- Assigned To must be an Authorised Person who is assigned a Profession which contains the same Discipline as the Discipline of the Job Card.
- If a Job Card is assigned a Job Card Status which has Locks Job Card set to true or is assigned to a Work Pack that is locked, then no fields on Job Card apart from the Signed Off Date, Signed Off By, Accepted Date, Accepted By, Assigned Date, Assigned To, Rejected Reason and Comments may be changed until either the Status has been removed or the Job Card is unlocked. When the Job Card is locked due to the Work Pack then the Job Card Status also cannot be changed.
- Signed Off By, Assigned To and Accepted By must be an Authorised Person who has the “Sign Off Job Cards” permission.

### 27.3.4 Operation

- A Tag ITR may only be associated with one Operation.
- If an Operation is assigned to a Job Card that is locked, either via the Job Card Status or the Job Card's Work Pack's Status, then only the Is Completed value of the Operation can be changed. All other fields will be locked.
- Only one of the Is Complete and Percent Complete fields can be populated. It is recommended to use the Is Complete field when Operation Progress Type of the Operation is ‘Checkbox’ (and the





Percent Complete field when 'Percentage'), but both fields can be used to update the value. When Operation Progress Method is 'Checkbox', only 0 or 100 can be used as Percent Complete value. Entering a value between these ranges will fail the validation. The UI dynamically shows either Is Complete or Percent Complete field according to the Operation Progress Method, thus using a different field is possible only via Imports and API.

## 28 Handovers

### 28.1 Definition

Handover Certificates, usually referred to simply as ‘Handovers’ are used to guarantee Technical Integrity when responsibility is being transferred between Authorities.

Exactly what is being handed over, and when, varies between company, project and geographic location. Because of this, GoTechnology® applications have a flexible approach, with a variety of Handover configurations which can be used on a “per-project” basis (Level D within hub2) allowing each to have its own Handover configuration.

The key components in each Handover are:

1. Name
2. Grouping
3. Gating

While the name is self-explanatory, the Grouping and Gating require further explanation.

#### 28.1.1 Grouping

The Handover Grouping controls the “what” of the Handover, as in “What is it that I am handing over?” Perhaps the most commonly used Handover Groupings are System and Subsystem (e.g. when a Subsystem Handover is completed it represents a statement that responsibility for that Subsystem can be transferred onwards) but there are other categories too. The following groupings are available in hub2

1. Certification Grouping
2. System
3. Subsystem
4. Primary Handover
5. Secondary Handover
6. System / Discipline
7. Subsystem / Discipline
8. Area
9. Module
10. Level E

#### 28.1.2 Gating

The Handover Gating determines the “which” (the ‘scope’) and “when” (the ‘ordering’) of the Handover within the overall project, serving to answer the questions “Which certificates/ITRs are covered by this Handover and when in the complete Handover process should this particular Handover occur?”

Both questions are answered with a single field: The Handover Gate Number.

This field acts as both a link between the Handover and the ITR Classes as well as a means of ordering the Handover within the project.



#### 28.1.2.1 Example: How Gating affects ordering.

As an example of how this works, consider a scenario where there are three Handovers (please note these are intended as examples only):

Handover	Gating
HOC	3
MCDAC	1
PCDAC	2

Table 35. **Example Handover listing demonstrating a simple Gating order.**

The Handovers are listed above alphabetically; however, in terms of the order within the Process, the MCDAC comes first, followed by the PCDAC and finally the HOC.

We can expand this further with an additional Handover:

Handover	Gating
CCC	1
HOC	3
MCDAC	1
PCDAC	2

Now we can see that both the CCC and the MCDAC are to be completed first, followed by the PCDAC and HOC.

#### 28.1.2.2 Example: How Gating affects scoping.

If we retain our previous set of four Handovers and introduce a table listing our ITRs and ITR Classes we can see how Gating affects scoping too.

ITR Class	Gating
COM	3
MC	1
PC	2

Now we know that our CCC and MCDAC cover all ITRs in the MC ITR Class, our PCDAC covers all in the PC class and our CCC in the COM class.

#### 28.1.3 Walk Downs

Another key element in the handover process involves the physical inspection of the scope of the Handover (be it a System, Subsystem, Area or something else) by the process stakeholders. This process is known as a Walk Down.

There may be multiple Walk Downs held but all have the same general purpose: To identify any unrecorded defects and to verify that defects which have previously been identified have been actioned appropriately.

#### 28.1.4 Handover Type

The Handover Type Gate entity defines a set of gates which can be used by Handover Types. Gating is described in detail in the Definition subsection of the Handover section of this document.

### 28.2 Additional Functionality

#### 28.2.1 Handover Type Settings

When creating a Handover Type via the Reference Table several additional options are available which will affect the fields available on the Handover

- **Grouping** – Explained in the definition section, this will control what Level the Handover can be raised at
- **Gates** – Explained in the definition section, this will control what ITRs are shown against the Handover
- **Interim Accepted Date** – Will add an additional sign off before Accepted Date
- **Track Walk Downs** – If the Walk Down section is shown or not
- **Multi Handover** – If Multiple Handovers can be grouped together i.e. 2 Sub Systems on the same Handover.
- **Show Includes/Excludes** – Adds two extra Comment Text boxes where details of what the Handover Includes and what the Handover Excludes can be recorded.
- **Generation Method** – If Digital Documents are used or if the documents are instead generated as DOTX Templates.
- **Show on Front Screen** – Can only be set on one Handover Type. This Handover Type will then have a Skyline and a S-Curve chart shown on the Front-Page Dashboard.

## 28.2.2 Raise Page

The screenshot shows the 'Raise / Delete MCDACs' interface. At the top, there are dropdown menus for 'Imports', 'Ref. Tables', 'Tagged Items', 'Certification', 'Punch List', 'Handovers', 'Procedures', 'Changes', 'Preservation', 'Documents', 'Report', and 'Admin'. The user 'John' is logged in. Below the header, the title 'Raise / Delete MCDACs' is displayed. The form contains several input fields and buttons:

- Handover:** A dropdown menu.
- Completed ITRs:** Buttons for 'All', 'Any', and 'None'.
- Discipline:** An input field with a search icon.
- Handover Accepted By:** An input field with a search icon.
- Handover Accepted Date:** Two input fields separated by a dash.
- Handover Comments:** An input field.
- Handover Planned Finish Date:** Two input fields separated by a dash.
- Handover Planned Start Date:** Two input fields separated by a dash.
- Outstanding ITRs:** Buttons for 'All', 'Any', and 'None'.
- Show Additional Filters:** A button with a dropdown arrow.
- Search Results:** A table with columns: Action, Handover, Sub System, Discipline, Total Tags, Total ITRs, Completed ITRs, Outstanding ITRs, and Handover Accepted Date. The table lists five rows, each with a 'Raise' button in the Action column and various subsystem codes (AL-045-501) in the other columns.

Figure 39. Screenshot of the Raise Handover page

The Raise Handover page allows users to raise new Handovers to be progressed. Although the Grouping and Gates of the Handover have already been specified via the Handover Type, it may be the case that not all items are to be included in this Handover. For example, there may be 100 Sub Systems, but only 70 of these are to be handed over via this Handover Methodology.

The page will list all the available items that could potentially be handed over and allow the user to select multiple at once.

When a Handover is raised, it will automatically be given a Handover Number based on the Default Handover Number format.

### 28.2.2.1.1 Buttons

UI Element	Type	Description	User Restrictions	Feature Restrictions
Search	Button	Searches all the items by the current search filters	Read Permission	None
Clear	Button	Clears all the search filters.	None	None
Raise Selected Handover	Button	Raises one Handover for each of the selected values.	Add Permission	None
Raise Selected as Multi Handover	Button	Raises one Handover for all selected items.	Add Permission	Must be Multi Handover

Raise All From Search	Button	Raises a Handover for every item returned in the search	Add Permission	None
Delete	Button	Deletes the selected Handover, even if Handover has been progressed	Add Permission	None

Table 36. **Details on the buttons on the Handover Raise page**

### 28.2.3 Tag ITR Counts

When the results are returned for a Handover search, on the search screen next to each Handover there will be a listing of Total number of Tag ITRs, the number of Tag ITRs complete and the number outstanding.

### 28.2.4 Level E Handovers

Level E Handovers do not have a Raise or Search page, because there is a one-to-one relationship between each Level E item and the corresponding Handover. Selecting the Level E Handovers from the Menu Bar will instead direct the user to the View page.

### 28.2.5 Generate

The “Generate” button will attempt to generate the selected Handover via the appropriate generation method.

Handover Type records which have the Generation Method field set to ‘DOTX Template’ will attempt to generate DOCX files, if there is a DOTX template stored for the Handover Type. A warning message will be shown to the user if no matching DOTX template file can be found to use in the generation.

Handover Types with the Generation Method field set to ‘Digital Document’ will attempt to generate a PDF if there has been a Digital Document created. A warning message will be shown to the user if there has not been a Digital Document created.

### 28.2.6 Generate Full Handover Documentation

Generating the full Handover documentation in PDF format can be performed using the buttons available in the Document Generate Panel on the Handover view page.

Generating the Document will generate a PDF file with the following:

1. The Cover Sheet for the Handover Type, if one exists
2. Digital Document of the selected Handover using a template Handover stored against the Handover Type.
3. Digital Document of the all Tag ITRs belonging to the selected Handover using a digital document template stored against the ITR.

The Documents will be generated in the above order.



Due to the time it takes to generate this document, selecting Generate will launch a background process that will send an alert to the user once the document generation is completed. Once the document has been generated it can be downloaded again at any time using the Download button from the same Panel.

To regenerate the document, the existing copy must first be deleted from the Document Generate Panel.

### 28.2.7 Walk Downs

The Walk Downs table will only be shown if the Handover Type has ‘Walk Downs’ enabled, otherwise this will be hidden. It will show details on the Walk Downs raised, the Date Completed and the Inspector who completed them, as well as the Planned Date.

On the Handover edit page a Walk Down can be added by selecting the Walk Down Discipline. Only one Walk Down can be performed per Discipline.

### 28.2.8 Tag ITRs

This table shows details on all the Tag ITRs associated with that Handover. Above the table is a status bar showing the overall progress of Tag ITRs. It gives counts for the Total ITRs, Total Outstanding, and Total Complete. The status bar will change colour based on the Status of the Handover. This table will not be available for Level E Handovers as it could contain all the Tag ITRs in the application.

Status	Definition	Background Colour
<b>Handover Complete</b>	The Handover Accepted Date is completed	Blue
<b>Overdue</b>	The Handover Planned Finished Date is in the past (before today) and the Handover Accepted Date is not completed.	Red
<b>ITR Complete</b>	All the ITRs are completed, but the Handover is not overdue (red) and the handover is not completed (blue)	Green
<b>All Others</b>	Any other status	Transparent

Table 37. **Handover Status Table**

There is also be a button linking to the Tag ITR Search page which will automatically return the same results but in the search page allowing for more detailed filtering.

### 28.2.9 Punch List Item

This table shows details on all the Punch List Items associated with that Handover. Above the table is a status bar showing the overall progress of Punch List Items. It gives counts for the Total Punch List Items, and Total Complete. The status bar will change colour based on the Status of the Punch List Items. This table will not be available for Level E Handovers as it could contain all the Punch List Items in the application.

Status	Definition	Background Colour
<b>Complete</b>	When all the Punch List Items are Completed.	Green
<b>All Others</b>	Any other status	Transparent

Table 38. **Punch List Item Handover Status Table**



There is also a button linking to the Punch List Item Search page which will automatically return the same results but in the search page allowing for more detailed filtering.

### 28.2.10 MOC

This table shows details on all the MOC Items associated with that Handover. Above the table is a status bar showing the overall progress of MOCs . It gives counts for the Total MOC Items, Total Answered and Total Closed. The status bar will change colour based on the Status of the MOC Items. This table will not be available for Level E Handovers as it could contain all the MOC Items in the application.

Status	Definition	Background Colour
<b>Answered</b>	When all the MOCs are Cleared.	Green
<b>Closed</b>	When all the MOCs are Completed.	Blue
<b>All Others</b>	Any other status	Transparent

Table 39. **MOC Handover Status Table**

There is also a button linking to the MOC Search page which will automatically return the same results but in the search page allowing for more detailed filtering.

## 28.3 Validation & Business Rules

### 28.3.1 Handover Type

The following Validation rules apply to Handover Types.

1. Handover Types cannot be deleted or have their grouping changed when in use. A type is considered in use if one or more Handovers of that Type have been raised .
2. Each Handover Gate must be a whole integer, and each Handover Gate text box must be filled in. The Handover Gates can be set to have no Gates by removing all text boxes.
3. Track Walk Downs is not available on Level E Handovers
4. Level E Handovers cannot be Multi Handover.

The Multi Handover, Interim Dates and Track Walk Downs all change the functionality of the Handovers. These changes are explained in the Handover section.

### 28.3.2 Handover

The following Validation rules apply to Handovers

1. Handovers cannot be deleted once in progress; a Handover is considered in progress when the Handover has an Accepted Date or Interim Accepted Date.
2. A Handover's Interim Accepted Date and Interim Accepted By must be filled in concurrently.
3. A Handover's Accepted Date and Accepted By must be filled in concurrently.
4. A Handover's Verified Date and Verified By must be filled in concurrently.
5. A Handover's Verified Date cannot be set without an Accepted Date.
6. A Handover's Verified Date must be after the Accepted Date.
7. A Handover's Interim Accepted Date, Accepted Date and Verified Dates cannot be in the future.
8. A Handover's Accepted Date must be after the Interim Accepted Date, if the Interim Accepted Date is set.



9. The Inspected By and Inspection Date for each Walk Down must be filled in concurrently.
10. Inspection Date for each Walk Down cannot be in the future
11. A Handover's Planned Start Date must be before its Planned Finish Date
12. Interim Accepted By, Accepted By and Verified By must be by an Authorised Person who has the "Sign Off Handovers" permission
13. Sub System/Discipline and System/ Discipline Handovers can be multi Handovers but only across one Discipline i.e. Multiple Handovers can be one certificate if they share a Discipline
14. Inspected By must be by an Authorised Person who is assigned a Profession which contains the same Discipline as the Discipline of the Walk Down.

## 29 Preservation

### 29.1 Definition

#### 29.1.1 Preservation

Preservation involves tasks related to ensuring unused equipment is kept in working condition. These tasks are often repeated on a regular schedule, to ensure the equipment is properly maintained and ready to use when required.

#### 29.1.2 Preservation Work List (PWL)

Within hub2 'Preservation Work Lists' (PWLs) are used to record the completion of preservation tasks, and can be assigned to Tags, in a similar fashion to ITRs. The difference is that PWLs are part of a regular schedule of maintenance on unused equipment, while ITRs are used to sign-off that installed equipment is safe and has been properly tested as part of the Handover process (in which the ultimate goal is to start, or restart, the facility).

#### 29.1.3 Tag Preservation Work List (Tag PWL)

Just as a Tag ITR represents an actual assignment of an ITR to a Tag so does a Tag PWL represent a PWL to a Tag. To explain this further; our PWL table will contain an entry for each type of Work List available for use. So, if there are ten different Work List types (perhaps named 'PRES-A', 'PRES-B', 'PRES-C' and so on) then there will be ten entries in the PWL table.

However, any one of these PWLs may be assigned multiple times to many different tags. This is where the Tag PWL entity comes into play; storing the details of each Work List the user creates and assigns.

#### 29.1.4 Frequency

The Frequency of a Tag PWL describes how regularly the applicable preservation work should be performed. If a Tag PWL has a Frequency of seven days, then it should be performed once every week.

If it has a Frequency of 365 days it should be performed once, and then is not due for another 365 days, either from the Due Date (so the schedule remains consistent) or from the Sign-Off Date (so the schedule adjusts based on when the Tag PWL was actually signed off), depending on the configuration of hub2.

#### 29.1.5 Due Date and Sign-Off Date

The Due Date is when the Tag PWL is expected to be completed by, while the Sign-Off Dates is when the Tag PWL is completed. It is possible in hub2 to apply restrictions to when this Sign-Off can be accomplished, via the Level C Preservation Window Before and Preservation Window After settings.

The actual sign offs for a Tag PWL are configurable using the Flexible Sign Offs, and only the "Completed" Sign off is affected by the Preservation Window.

#### 29.1.6 Preservation Window (do you need this section, it is basically a repetition of section 29.2.1.1)

The Preservation Window (via the Preservation Window Before and Preservation Window After fields on Level C) allows restrictions to be placed on when a Tag PWL can be signed-off, specifically in relation to the Due Date.



The settings allow the Preservation Window to be restrict how many days before and how many days after the Due Date is acceptable. These values can be different. If either (or both) value is left blank, then no restriction applies.

#### 29.1.6.1 Examples

##### 29.1.6.1.1 Due Date: 14 February 2017

Due Date	Preservation Window		Acceptable Sign-Off Values
	Before	After	
14 February 2017			Any
14 February 2017		2	Any date <b>before</b> 17 February 2017.
14 February 2017	2	2	12 February 2017 to 16 February 2017.
14 February 2017	5	2	9 February 2017 to 16 February 2017.

Table 40. Preservation Window inputs and outputs based on a Due Date of 14 Feb 2017

##### 29.1.6.1.2 Due Date: 20 March 2049 (needs aligned)

Due Date	Preservation Window		Acceptable Sign-Off Values
	Before	After	
20 March 2049			Any
20 March 2049		2	Any date <b>before</b> 19 March 2049. (before 23 <sup>rd</sup> March)
20 March 2049	3	4	17 March 2049 to 24 March 2049
20 March 2049	31	16	17 February 2049 to 5 April 2049

Table 41. Preservation Window inputs and outputs based on a Due Date of 20 Mar 2049

## 29.2 Overview

PWLs are assigned to Tags and are given a Due Date for when they are expected to be completed. These Tag PWLs can also have a Frequency set, this will allow the preservation to be repeated.

When a Tag PWL which has a frequency is completed a new Tag PWL record is created with the same Tag and PWL but with its Due Date field advanced, this new item will be used to track the next occurrence of the preservation work. The Due Date for the new Tag PWL will be the Frequency value (in days) added to the Tag PWL's Due Date or Completed Date (The choice of which date is used is configurable)

The signed off Tag PWL is now stored as the history of preservation work which has been carried out, this can also have a verification sign off added and a Completion Status added to allow for tracking of preservation work which was not completed or put on hold.

### 29.2.1 How Preservation works in hub2

The table structure for Preservation will be:

- 1) **Tag PWL** – This table contains the link to both Tag and PWL reference item, it also contains the Due Date, Frequency, Sign Off Date (and Sign Off By), as well as the Verified Date (and Verified By), and the Completed field.

When a user “Signs Off” a Tag PWL the following actions occur:

- 2) The Tag PWL has its Sign Off Date and Signed Off By fields populated with the user’s input.
- 3) If the Tag PWL has a populated Frequency field then a **new** Tag PWL item is created with the same Tag, PWL, Frequency and End Date field data, however the Due Date field will be set by adding the Frequency (days) to the original Signed Off Item’s Due Date field (or the chosen Sign Off Date, depending on the current Level C Features).

This will mean there is a Tag PWL record for every signed off occurrence of preservation. Preservation ‘History’ will be any Tag PWL record which has a populated Sign Off Date field.

### 29.2.2 Preservation Configuration

There will be two configurable settings in hub2 for Preservation, which will be referenced throughout this document. The sections below explain what these configurable settings are and the different options for each which are available.

#### 29.2.2.1 Preservation Window

Preservation Window is the method of limiting the date range in which a Tag PWL can be signed off. If there is not a Preservation Window set, then Preservation can be signed off on any date regardless of the Due Date.

Preservation Window is configured by setting values into two Level C fields: Preservation Window Before and Preservation Window After.

The following show the possible Preservation Window configurations and the results:

Preservation Window Before Value	Preservation Window After Value	Sign Off Range (for a Tag PWL with Due Date: 15 <sup>th</sup> January 2016)
No Value (null)	No Value (null)	Any Date. When both Preservation Window fields have no value, there will be no restrictions on when preservation can be signed off.
No Value (null)	2	Any date prior to and including the Due Date (15/01/2016) and up to 2 days after the Due Date (17/01/2016).
3	No Value (null)	From three days prior to the Due Date (12/01/2016) and any date after as there will be no restriction on sign offs after the Due Date.

0	0	When both values are set to zero Preservation can only be signed off on the Due Date (15/01/2016).
0	2	From the Due Date (15/01/2016) and up to two days after the Due Date (17/01/2016).
1	0	From one day prior to the Due Date (14/01/2016) up to the Due Date (15/01/2016).
2	3	From two days prior to the Due Date (13/01/2016) up to three days after the Due Date (18/01/2016).

Table 42. **Preservation Window Configurations**

#### 29.2.2.2 Preservation Progress Method

Preservation Progress Method is a Level C setting which will be used to determine the next Due Date when advancing Preservation which is being signed off. When any Tag PWL item which has a populated Frequency field is signed off a new Tag PWL record will be created and its Due Date will be set based on the Preservation Progress Method as detailed in the following table:

Preservation Progress Method	Due Date	Sign Off Date	Advanced Due Date (Frequency of 5 Days)
Due Date	15/01/2016	18/01/2016	20/01/2016
Sign Off Date	15/01/2016	18/01/2016	23/01/2016

Table 43. **Preservation Progress Method Configurations**

### 29.3 Additional Functionality

#### 29.3.1 Preservation Look Ahead

The Preservation Look Ahead page will allow the user to view and search all Tag PWL items including those that are projected to exist in the future, based on the current Tag PWLs being signed off on their due date.

This page uses the same standard search page as other section with a few minor differences.

- The “To Due Date” filter will be populated with a date which is one month in the future of the current date to limit how far the future preservation is projected for in the search results on page load.
- There is no Export, Delete, Assign or Sign Off functionality on this page since some of the Preservation is projected and does not actually exist.

### 29.3.2 Related Tag PWL Table

On the View screen of the Tag PWL there is an additional table which shows all the Tag PWLs that have the same Tag and PWL as the current item and thus shows the history of each time this partial PWL has been signed off for the Tag. Thus, allow the user to review each item of associated Preservation.

Field	Path	Type	Sortable
Due Date	Due Date	Link to the Tag PWL due on that date	Yes
Signed Off By	Signed Off By	Link to the Authorised Person View page	Yes
Signed Off Location	Signed Off Location	Text	Yes
Completion Status	Preservation Completion Status: Name	Link to the Preservation Completion Status View page	Yes

Table 44. Related Tag PWL Fields shown on the Preservation View page

## 29.4 Validation & Business Rules

### 29.4.1 Validation

#### Preservation Window (Admin)

- Preservation Window Before and Preservation Window After cannot be greater than 1100 days (3 Years).
- Preservation Window Before and Preservation Window After cannot be negative numbers.

#### Tag Preservation Status

- Only one Preservation Completions Status can have the Is Default field set at time, within each Level B. Attempting to set more than one Preservation Completion Status to have an Is Default field equal to true within the same Level B will cause a validation error message to appear.

#### Tag PWL

- Signed Off By and Signed Off Date and Preservation Completion Status must all be filled in concurrently.
- Verified By and Verified Date must both be filled in concurrently.
- Signed Off Date cannot be filled in unless there is a Due Date.
- Verified By and Verified Date cannot be edited or set until Signed Off By and Signed Off Date have been populated and saved.
- Verified Date must be either on the same day or after Signed Off Date.
- Due Date cannot be set to be after the End Date.
- Signed Off Date and Verified Date cannot be in the future.
- Frequency cannot be a negative number.
- Frequency cannot be greater than 1100 (Current limit – 3 Years).

- If both Preservation Window Before and Preservation Window After do not have a value then Tag PWLs can be signed off at any date.
- If Preservation Window Before is populated, then Sign Off Date can be no more than Preservation Window Before (Days) before the Due Date.
- If Preservation Window After is populated, then Sign Off Date can be no more than Preservation Window After (Days) after the Due Date.
- If the Preservation Completion Status used requires a reason (set via the Preservation Completion Status Requires Reason field) then Tag PWL must have a Comment.
- Preservation cannot be signed off if this will lead to the creation of a Tag PWL on with the same Tag, PWL and Due Date as an existing item
- Signed Off By, Assigned To and Verified By must be by an Authorised Person who has the “Sign Off Preservations” permission
- Signed Off By, Assigned To and Verified By must be by an Authorised Person who is assigned a Profession which contains the same Discipline as the Discipline of the PWL.

#### 29.4.2 Business Rules

When signing off a Tag PWL the following actions will be taken:

- Tag PWL's Completed Location ID field will be set to the same value as the Tags current Location.

If a Tag PWL has a populated Frequency field which is not equal to 0, and the potential next Due Date (explained below) is not after the current End Date the following will occur when signing off:

- A new Tag PWL will be created with the same Tag ID, PWL ID, Level E ID, End Date, Frequency. The Due Date will be set to the potential next Due Date (explained below)

**Potential next Due Date** is calculated as follows:

- If Preservation Progress Date setting is set to Due Date, the potential next Due Date is current Due Date plus Frequency (days).
- If Preservation Progress Date setting is set to Sign Off Date, the potential next Due Date is Sign Off Date plus Frequency (days).

## 30 Procedures and Skeleton Procedures

### 30.1 Definition

#### 30.1.1 Procedure

A Procedure is a set of logically sequenced instructions for executing a class of activity. There can be many different types of Procedures with the main one in hub2 being Commissioning procedures. This is a Procedure containing step-by-step descriptions of activities required to commission an object.

#### 30.1.2 Procedure Section

Procedures are commonly sub-divided into separate sections, which are represented by Procedure Sections in hub2.

#### 30.1.3 Procedure Step

Procedure Steps represent the actual activities associated with a Procedure. In this regard, they fill a similar role as a task on an ITR.

#### 30.1.4 Procedure Skeleton

A Procedure Skeleton is like a Procedure as it contains a list of instructions, but these do not have any specific detail. This acts as a template so the Procedure Skeleton can later have specific details filled in to match a required activity. This ensures consistency and efficiency in the development of Procedures.

#### 30.1.5 Procedure Skeleton Section

A Procedure Skeleton Section represents a template of a Procedure Section with no progress reporting functionality. It can be utilised to define standardised structures which can be cloned and reused to produce consistent Procedures.

#### 30.1.6 Procedure Skeleton Step

A Procedure Skeleton Step represents a template of a Procedure Step with no progress reporting functionality. It can be utilised to define standardised sets of activities which can be cloned and reused to produce consistent Procedures.

## 30.2 Additional Functionality

### 30.2.1 Clean Energy

If the Clean Energy functionality is enabled the following custom fields are automatically added. The custom fields cannot be edited or removed without first disabling the functionality.

Name	Description	Table Type	Field Type
Safety Status	Safety Status	Procedure	Reference Table
Location of Original	Location of Original	Procedure	String
Actual Finish Date	Actual Finish Date	Procedure	Date

Document Required by Date	Document Required by Date	Procedure	Date
Client Review Required	Client Review Required	Procedure	Bool
Document Sent Date	Document Sent Date	Procedure	Date
Document Return Date	Document Return Date	Procedure	Date
Document Uploaded	Document Uploaded	Procedure	Bool
Test Start Date	Test Start Date	Procedure	Date
Test Review Required	Test Review Required	Procedure	Bool
Test Results Transmittal	Test Results Transmittal	Procedure	String
Date Test Transmittal Returned	Date Test Transmittal Returned	Procedure	Date
Completed Document Uploaded	Completed Document Uploaded	Procedure	Bool
Approved Document Uploaded	Approved Document Uploaded	Procedure	Bool
Test Location	Test Location	Procedure	Reference Table
IcepacReference	Icepac Reference	Procedure	String
Sub System No	SubSystem No	Procedure	Reference Table
Reviewed By CTL	Reviewed By CTL	Procedure	Reference Table
Document Production Progress	Document Production Progress	Procedure	Reference Table

Table 45. **Clean Energy Custom Fields**

In addition to the custom fields being added, the View and Edit screen layouts are modified and split into three sections. These sections display fields in a specific order, with each section containing a combination of both custom and standard fields.

### 30.3 Validation & Business Logic

#### 30.3.1 Procedures

- There must be at least one System value in the Systems table for each Procedure
- All Sign Off fields must be completed by an Authorised Person who has the Sign Off Procedures permission
- Procedure cannot have itself as a Prerequisite Procedure
- Planned Start Date must be before Planned Finish Date



### 30.3.2 Procedure Sections

The following Validation Rules must be met

- Parent Procedure Section cannot be the same as the current Procedure Section or any of the Procedure Sections children
- If the Completed Date or Completed By field is set, the other field must also be set
- Procedure Section and Parent Procedure Section must have the same Procedure
- Completed Date field cannot be in the future. The current date is determined by the time zone set for Level E
- Completed By field must be completed by an Authorised Person who has the Sign Off Procedures permission

### 30.3.3 Procedure Steps

- If the Completed Date or Completed By field is set, the other field must also be set
- Completed Date field cannot be in the future. The current date is determined by the time zone set for Level E
- Completed By field must be completed by an Authorised Person who has the Sign Off Procedures permission



## 31 As Built Drawings

### 31.1 Definition

As Built Drawings reflect what was constructed, rather than what was originally drawn. They are usually required when circumstances on site require a deviation and are issued when construction is complete. Each As Built Drawing is uniquely identified by a Drawing and optionally one or more of the following: Secondary Handover, Discipline and Job Card.

### 31.2 Additional Functionality

There is no additional functionality for As Built Drawings

### 31.3 Validation & Business Rules

#### 31.3.1 As Built Drawings

Each As Built Drawing must be a unique combination of Drawing and Revision.

#### 31.3.2 Single Drawing Attachments

When uploading Attachments to Drawings via the Attachment Grid on the Drawing View Page, it is possible to restrict this to one Attachment per Drawing. This feature is selected at Level C.

## 32 Auto Allocation of Data

hub2 allows certain data to be automatically “allocated” (created and assigned) based on user defined mappings. This functionality is offered as a way of reducing the workload involved in inputting large amounts of repetitious data. The most common and widely used auto-allocation of data involves using the Equipment Types to automatically assign ITRs or PWLs to Tags.

### 32.1 Equipment Type to ITR

#### 32.1.1 Definition

The Equipment Type to ITR mapping utilises the Tag's Equipment Type and Equipment Status to automatically assign the correct ITRs. While the Equipment Type must be filled in for each row, the Equipment Status is an optional field and can be left blank.

When assigning via the reference table, each row of the table defines a new rule. Multiple rules can be added for an Equipment Type and Equipment Status combination.

##### 32.1.1.1 Examples

**32.1.1.1.1 Example 1: Mapping two ITRs for auto-allocation, based on Equipment Type and Status.**

Equipment Type	Equipment Status	ITR	Test Reference
A	Offshore	QED-A01A	1
A	Offshore	QED-A02A	1

Table 46. **Example 1: Equipment Type to ITR Mapping.**

Example 1 gives a straight-forward situation: Every Tag which features Equipment Type “A” and Equipment Status “Offshore” will automatically be allocated a QED-A01A and QED-A02A ITR.

When a new Tag with these two attributes is created, the two corresponding ITRs will also be created and assigned to the Tag.

**32.1.1.1.2 Example 2: Mapping two ITRs of the same type with different Test References.**

Equipment Type	Equipment Status	ITR	Test Reference
A	Offshore	QED-A01A	1
A	Offshore	QED-A01A	2

Table 47. **Example 2: Equipment Type to ITR Mapping**

It's also possible to map the same type of ITR multiple times, as shown in Example 2. This can be accomplished by keeping the Equipment Type, Equipment Status and ITR Name (displayed on page and in the above table as just “ITR” for simplicity's sake) the same but entering a different Test Reference. This may be useful in situations where the certification process must be repeated later.



#### 32.1.1.3 Example 3: Assigning multiple ITRs.

The user can create mappings that automatically assign multiple ITRs by adding rows with the same Equipment Type and Equipment Status.

Equipment Type	Equipment Status	ITR	Test Reference
A		QED-A01A	1
A		QED-A02A	1
B		QED-B01A	
C	Onshore	QED-C01A	1
C	Offshore	QED-C02A	1

Table 48. Example 3 Equipment Type to ITR Mapping.

If the Tag has Equipment Type “A” it will be assigned two ITRs; a QED-A01A and a QED-A02A. As the Equipment Status is blank for Equipment Type “A”, the Tag will be assigned both ITRs regardless of its Equipment Status.

If the Tag has Equipment Type “C” the ITR assigned will depend on the Tag’s Equipment Status. If “Onshore” is set, then a QED-C01A will be assigned, if “Offshore” is set then a QED-C02A will be assigned.

If the Equipment Status is not set on the Tag, or set to a value other than “Onshore” or “Offshore”, it will not have any ITRs assigned.

To explain this further, here is a table showing the results of the above mapping.

Equipment Type	Equipment Status	ITRs (Test Reference) assigned.	Explanation
A	Red	QED-A01A (1), QED-A02A (1)	
A		QED-A01A (1), QED-A02A (1)	
A	Brand New	QED-A01A (1), QED-A02A (1)	All <u>Tags</u> with <u>Equipment Type</u> A receive a QED-A01A and a QED-A02A. The difference in <u>Equipment Status</u> has no impact because in the original mapping the <u>Equipment Status</u> was left blank, meaning “any”.
A	Onshore	QED-A01A (1), QED-A02A (1)	
A	Offshore	QED-A01A (1), QED-A02A (1)	
A	ABCDEFGHIJKLMN	QED-A01A (1), QED-A02A (1)	

B	Red	QED-B01A	
B		QED-B01A	
B	Brand New	QED-B01A	All <u>Tags</u> with <u>Equipment Type</u> B receive a QED-B01A. The difference in <u>Equipment Status</u> has no impact because in the original mapping the <u>Equipment Status</u> was left blank, meaning "any".
B	Onshore	QED-B01A	
B	Offshore	QED-B01A	
B	ABCDEFGHIJKLMN	QED-B01A	
C	Red		No mapping exists with <u>Equipment Type</u> C and <u>Equipment Status</u> Red.
C			No mapping exists with <u>Equipment Type</u> c and no <u>Equipment Status</u> .
C	Brand New		No mapping exists with <u>Equipment Type</u> c and <u>Equipment Status</u> Brand New.
C	Onshore	QED-C01A (1)	
C	Offshore	QED-C02A (1)	
C	ABCDEFGHIJKLMN		No mapping exists with <u>Equipment Type</u> c and <u>Equipment Status</u> ABCDEFGHIJKLMN.
D	Red		
D			
D	Brand New		
D	Onshore		No mapping exists with <u>Equipment Type</u> D.
D	Offshore		
D	ABCDEFGHIJKLMN		

Table 49. Results table for the example Equipment Type to ITR mapping.

## 32.2 Equipment Type to PWL

### 32.2.1 Definition

The Equipment Type to PWL mapping utilises the Tag's Equipment Type and Equipment Status to automatically assign the correct PWLs. While the Equipment Type must be filled in for each row, the Equipment Status is an optional field and can be left blank.

When assigning via the reference table, each row of the table defines a new rule. Multiple rules can be added for an Equipment Type and Equipment Status combination.

#### 32.2.1.1 Examples

##### 32.2.1.1.1 Example 1: Mapping two PWLs for auto-allocation, based on Equipment Type and Status.



Equipment Type	Equipment Status	PWL	Default Frequency
A	Offshore	QED-WL01	7
A	Offshore	QED-WL02	14

Table 50. **Example 1: Equipment Type to PWL Mapping.**

Example 1 gives a straight-forward situation: Every Tag which features Equipment Type “A” and Equipment Status “Offshore” will automatically be allocated a QED-WL01 and QED-WL02 PWLs.

When a new Tag with these two attributes is created, the two corresponding PWLs will also be created and assigned to the Tag.

### 32.2.1.1.2 Example 2: Assigning multiple PWLs.

The user can create mappings that automatically assign multiple PWLs by adding rows with the same Equipment Type and Equipment Status.

Equipment Type	Equipment Status	PWL	Test Reference
A		QED-WL01	1
A		QED-WL02	1
C	Onshore	QED-WL03	1
C	Offshore	QED-WL04	1

Table 51. **Example 3 Equipment Type to PWL Mapping.**

If the Tag has Equipment Type “A” it will be assigned two PWLs; a QED-WL01 and a QED-WL02. As the Equipment Status is blank for Equipment Type “A”, the Tag will be assigned both PWLs regardless of its Equipment Status.

If the Tag has Equipment Type “C” the PWL assigned will depend on the Tag’s Equipment Status. If “Onshore” is set, then a QED-WL03 will be assigned, if “Offshore” is set then a QED-WL04 will be assigned.

If the Equipment Status is not set on the Tag or set to a value other than “Onshore” or “Offshore” it will not have any PWLs assigned.

## 32.3 Pages

The pages for Tag ITR and Tag PWL operate in much the same manner and are described below.

### 32.3.1 Equipment Type to ITR Reference Table

The Equipment Type to ITR page uses the standard pages with a search page, view page and edit page featuring all applicable fields.



### 32.3.2 Taggable Item Pages

#### 32.3.2.1 Auto Allocation

All Tag extensions include a checkbox to allow users to turn off the auto-allocation of Tag ITR/PWLs on a Tag by Tag basis. This checkbox is labelled “Ignore Equipment Type to ITR” or “Ignore Equipment Type to PWL”.

#### 32.3.2.2 State Symbols

Within the Tag ITR/PWL section of the Tag page a symbol is present to indicate the state of the Tag ITR/PWLs.

Symbol	Description	On Click
	All <u>Tag ITR/PWLs</u> match the conditions in the <u>Equipment Type to ITR/PWL</u> table	No on-click functionality
	There are <u>Tag ITR/PWLs</u> missing that should be present if the <u>Equipment Type to ITR/PWL</u> Matrix was followed. These could have been manually removed or never been added due to the <b>Tag ITR/PWL Auto-Allocation Setting</b> .	Redirects the user to <u>Equipment Type to ITR/PWL</u> page. Filtered to show Missing <u>Tag ITR/PWLs</u> for that specific <u>Tag</u> .
	The User has turned on the functionality via the <u>Tag's Allow Auto ITR/PWL</u> field or <b>Tag ITR/PWL Auto-Allocation</b> setting but there are no <u>Tag ITR/PWLs</u> in the <u>Equipment Type to ITR/PWL</u> Matrix.	
Not Present	The User has turned off the functionality via the <u>Tag's Allow Auto ITR/PWL</u> field or <b>Tag ITR/PWL Auto-Allocation</b> setting	

Table 52. Symbols displayed on Tagged Item view pages representing Equipment Type to ITR/PWL status.

### 32.3.3 Equipment Type to ITR/PWL Allocation Review page

ITR/PWLs that are “missing” based on the Equipment Type to ITR/PWL mapping will be displayed on this page, providing a useful way to correct any allocations and export the results (if required).

#### 32.3.3.1 Example 1

If the Equipment Type to ITR mapping says that all Tags of Equipment Type “A” should have a QED-A01A and a QED-A02A and there are Tags of this Equipment Type without any ITRs, the results will highlight this.

Equip Type to ITR Review

Recent Searches | Saved Searches

**Search** | **Clear** | **Save Search**

Tagged Item:PWL Test;

Tagged Item	ITR
PWL Test	<input type="button" value="Search"/>
Equipment Status	Equipment Type
<input type="text"/>	<input type="button" value="Search"/>
ITR Discipline	ITR Class
<input type="text"/>	<input type="button" value="Search"/>
Test Reference	
<input type="text"/>	

**Search** | **Clear** | **Save Search**

Search Results

**Export** | **Export As Tag ITRs** | **Add**

	Tagged Item	ITR	Equipment Type	Equipment Status	Test Reference
<input type="checkbox"/>	PWL Test	F02B	AB	Onshore	
<input type="checkbox"/>	PWL Test	F01A	AB	Onshore	

Page: 1 of 1 | Go | Page Size: 20 | Change | Item 1 to 2 of 2

**Export** | **Export As Tag ITRs** | **Add**

Figure 40. Screenshot of Equipment Type to ITR Allocation Review page

Section	Type	Description
Search	Button	Filters the results grid using the current search filters
Clear	Button	Clears all the search filters
Save Search	Button	Saves the search currently present in the search form.
Add	Button	Adds an <u>ITR</u> which has been marked as Missing/Removed
Export	Button	Exports the results for review
Export as <u>Tag ITR/PWLs</u>	Button	Exports the results in the <u>Tag ITR/PWL</u> format allowing them to be edited and imported.

Table 53. Equipment Type to ITR/PWL Search page buttons and functions

## 32.4 Settings

### 32.4.1 Auto Allocation Setting

hub2 can be configured to run the Equipment Type to ITR or Equipment Type to PWL matrix on a specific event(s). These settings can be set independently of each other on each Level E i.e. The ITR Matrix can be set to “On Tag Added” and the PWL Matrix can be switched “Off”.

The available settings for both are as follows:

- **On Tag Added – Tag ITR/PWLS** will be raised automatically when a new Tag is added, according to the rules set in the Equipment Type to ITR/PWL matrix.
- **On Tag Added and Equipment Type/Status Changes – Tag ITR/PWLS** will be raised automatically when a new Tag is added, or when an existing Tag's Equipment Type or Equipment Status is changed.

The Equipment Type to ITR/PWL matrix will be checked against the new Equipment Type/Status, and any matching Tag ITRs will be raised. Existing Tag ITR/PWLS which no longer match the matrix rules will **not** be deleted.

- **Advisory Only – Tag ITR/PWLS** will not be raised automatically. Users will be advised, via the Tag page, which Tag ITR/PWLS should exist according to the Equipment Type to ITR/PWL matrix.
- **Off –** There will be no visibility of the Equipment Type to ITR/PWL feature. This includes the reference tables, search pages and advisory items. There will be no auto population of Equipment Type to ITR/PWLS even if the section was previously populated.

## 32.5 Example Workflow

The following is an example workflow for the Equipment Type to ITR Matrix, the workflow for Equipment Type to PWL is nearly identical but with ITRs being replaced by PWL.

4. The following records are added to the Equipment Type ITR table:

Equipment Type	Equipment Status	ITR	Test Reference
MXP	Offshore	ITR-001-MXP	
RXT	Offshore	ITR-004-RXT	1
RXT	Offshore	ITR-004-RXT	2

Table 54. **Initial records to be populated into the Equipment Type ITR table for the Equipment Type to ITR workflow example.**

5. Then the following Tags are added to the Tag table:

Name	Description	Equipment Status	Equipment Type	Ignore Equipment Type to ITRs
Tag-001	First Tag	Offshore	MXP	False
Tag-002	Second Tag	Onshore	MXP	False
Tag-003	Third Tag	Offshore	MXP	True
Tag-004	Fourth Tag	Offshore	RXT	False

Table 55. Tags to be added in the Equipment Type to ITR workflow example.

- Upon saving the Tags above, the system will check to see if any of the Tag Equipment Types and Status match the rules in the Equipment Type to ITR Table and haven't been set to ignore the rulings at the Tag level. If they do, they will be automatically added.

Two of the four Tags match the rules and so the Tag ITRs have been added as per the table below. Tag-002 has an Equipment Status as "Onshore" and so doesn't match the rules, while Tag-003 has been set to ignore Auto Allocation of ITRs and so it also doesn't have any ITRs added.

Tag Name	ITR Name	Test Reference	WasAddedAutomatically
Tag-001	ITR-001-MXP		True
Tag-004	ITR-003-RXT	1	True
Tag-004	ITR-004-RXT	2	True

Table 56. Result of the Equipment Type to ITR allocation in the workflow example.

- If **Tag-004** does not need the ITR-004-RXT Tag ITR with Test Reference 2, this can be removed.

Tag Name	ITR Name	Test Reference	WasAddedAutomatically
Tag-001	Itr-001-mxp		True
Tag-004	Itr-004-rxt	1	True

Table 57. After manually removing one ITR from the Equipment Type to ITR workflow example,

- The Equipment Type to ITR Review page shows all Tag ITRs which are Missing/Removed. This page allows the user to raise the *Missing/Removed* Tag ITRs if need be.

Tag Name	ITR Name	Test Reference	Equipment Type	Equipment Status
Raise	Tag-004	ITR-004-RXT	2	RXT

Table 58. Represents how the results of the Equipment Type ITR page will appear after the workflow example.



wood.

## 33 Flexible Sign Offs

### 33.1 Definition

When completing certain documents within hub2, one or more signs off may be required (such as Tag ITRs or Punch List Items). The sign off process for these documents varies based on the company's process, the document being signed off (e.g. Tag ITR, Punch List) and even the class or type of the document (e.g. A PLIs Vs B PLIs).

To help ensure the process in hub2 reflects the process used by the client, certain sign off sections implement Flexible Sign Off. This allows an admin user to configure the Sign Offs at the start of the project and have that process be used by all users. The process can be changed at any time and all future sign offs will use the new process.

A Flexible Sign off will consist of 2 fields, an Authorised Person field or "By" field which shows who performed this sign off, and "Date" which shows the date the sign off was completed.

The following sections use Flexible Sign Offs

- Tag ITRs – Configured by ITR
- Tag PWLs – Configured by PWL
- Punch List Item – Configured by Punch List Item Category
- MOC – Configured by MOC Type
- Work Pack – Configured by Work Pack Type
- Assurance Tracker – Configured by Tracker Type

### 33.2 Functionality

#### 33.2.1 Configuring Sign Offs

The Sign Offs can be configured via the Reference Table section of the relevant type. Going to a reference table view page will show an additional "Sign Off" Panel which will show the pre-configured Sign Offs. These sign off can be edited by clicking the Edit Sign Off Button.



Edit Sign Offs for AR01
View AR01

 Save as New Revision
View AR01

Action	Label	Signed Off Type	
 Remove	Signed Off	By	Required
 Remove	Inspected	By	Optional
 Remove	Verified	By	Complete

 Add New Sign Off
View AR01

 Save as New Revision
View AR01

Figure 41. Edit Sign Offs Screen

Entities which have Flexible Sign Offs can be configured to have multiple sign offs. Each Sign Off must be given a unique name and a sign off type. This unique name will always be followed by “Date” or “By”, with the Date field being the date the sign off will be completed and “By” the Authorised Person who completed the sign off. The sign off type can be one of 3 options “Required”, “Complete” or “Optional”. Required is any sign off that must be completed before the “Complete” sign off. “Complete” is the sign off that will be used to consider the document complete. “Optional” is a sign off that isn’t required for the item to be considered complete but can be filled when necessary (i.e. “3<sup>rd</sup> party verification”)

One sign off for each configuration must be set as complete, and multiple items cannot be set as complete.

When an item with Flexible Sign Offs is used in conjunction with a Digital Document, the Flexible Sign Offs become part of the Digital Document process, and can be edited, completed and generated as part of the Digital Document process. Due to this the configuration is now part of the Digital Document screen, under the “Sign Off” tab.

UI Element	Type	Description	User Restrictions	Feature Restrictions
Save as New Revision	Button	<p>Displays the Revision Details dialogue where the user can enter the changes made to the Sign Off.</p> <p>Increasing the Revision will mean all documents will now use the sign off process except those already signed off, or with a Digital Document Template.</p>	Edit Permissions for the Parent Entity i.e. ITR, PWL etc.	None

UI Element	Type	Description	User Restrictions	Feature Restrictions
Remove	Link	Removes the Sign Off from the Sign Off Table	None	None
Label	Text Box	Displays the Name of the Sign Off. All Sign Offs will be followed by the word "Date" or "By" depending if it's the flexible sign off date, or the Authorised Person.	None	None
Signed Off Type	Drop Down	Drop Down with 3 options, "Required", "Complete" and "Optional"	None	None
Add New Sign Off	Button	A Button which allows an additional Sign Off Row to be added	None	None

Table 59. **Buttons for the Flexible Sign Offs Edit Page**

### 33.2.2 Default Sign Offs

To avoid having to configure Flexible Sign Offs for each individual ITR or PWL hub2 has Default Sign Offs. Default Sign Offs can be set for each section which implements Flexible Sign Offs. These defaults sign off will automatically be raised when a new item is added i.e. When a default Sign Offs for ITRs are set when a new ITR is raised it will automatically have its Flexible Sign Offs match the Default Sign Offs set. These defaults will be raised regardless of how the item was added i.e. Via Import, on screen or via the API. Once an item is created and its Flexible Sign Offs are set to match the Default Sign Offs it is still possible to edit individual items Sign Off configuration via the reference table.

Default Sign offs can be edited via the Default Sign Off screen, the user can select the specific section the default are configured for and this will launch a screen with the same layout as if editing a sign off on a specific item.

At least one Default Sign Off must be set prior to adding records to the relevant section i.e. If no Default Sign Offs are set for PWL then the PWL section cannot be used. Generally, default sign offs will be configured by WCS at the start up of a Project and can be changed at any time as required.

### 33.2.3 Exporting Sign Offs

Flexible Sign Offs will not be exported on the template entities i.e. The actual ITR export, however they will be exported on the actual result entities i.e. We will see the available sign offs on the Tag ITR Export.

### 33.2.4 Importing Sign Offs

Flexible Sign Offs can also be imported in the same way as the normal fields can be on result entities. When a table with flexible sign offs is exported from the application it will contain two columns for each sign off (Sign Off By and Sign off Date) and these can be edited and then the file can be uploaded via the Import section.



### 33.2.5 Search By Flexible Sign Offs

Flexible Sign Offs are available as search fields in the search page of the entities that use them. Each Sign Off can be searched by 3 search filter fields

- Signed Off By person
- Signed Off Date From and To
- All / Signed Off / Not Signed Off status

The Flexible Sign Off search filters are available under their own “Sign Offs” section within the “Show Additional Filters” panel. There will be Flexible Sign Offs filters available for each of the Flexible Sign Offs configured on the latest revisions of the template entities and any Flexible Sign Offs from the older revisions that are still in use.

### 33.2.6 Validation and Business Rules

- There must be a Default Sign Off set for each section before that section can be used i.e. To raise an ITR there must first be ITR Default Sign Offs
- One Sign Off must be set to Complete, this applies to the Default Sign Offs as well as Flexible Sign Offs for each item
- Only one sign off can be set to Complete, this applies to the Default Sign Off as well as the Flexible Sign Offs.
- All Sign Offs of type Required must be populated prior or at the same time as the Sign Off of type Complete.

## 34 Digital Document - Templates

### 34.1 Definition

With Digital Documents in hub2, you can create, maintain, progress, view and report on key documents. Digital Documents are available within multiple sections where normally paper based templates would be generated from the system and then uploaded as attachments back into the system.

Digital Documents are comprised of Header Rows & Fields, Tasks and Sign Offs. Header Fields will be specific data which will be populated into the generated document based on the specific entity which is being generated. Header Fields can also be editable to allow the text to be entered at the time of completion. Tasks will be the steps which must be carried out when completing the document, these can have multiple different options for progression such as Check Boxes, or Date/Signature entries for the user to input the result. The Sign Offs will match the Flexible Sign Offs for the entity.

Once a Digital Document has been created, the functionality will be there to generate this to an editable PDF file, and to be viewed and completed on screen or via the GoTechnology Companion App. Generating to an editable PDF file will allow the user to populate the Headers, Tasks and Sign Offs and then upload a completed PDF document into hub2. Any populated Headers, Tasks and Sign Off data will be stored in the database against the relative entity.

The sections of hub2 that use Digital Documents are

- Tag ITRs – Templates stored at the ITR Level
- Tag PWLs – Templates stored at the PWL Level
- Work Packs - Templates stored at the Work Pack Type Level
- Assurance Trackers – Templates stored on the Tracker Type Level
- Handovers – Templates stored on the Handover Type Level

For those section that use DOTX and Digital Documents Templates, only one template type can be used at a time, therefore there will be a drop down on a per item basis to switch between Digital Document or DOTX Template.

Left Logo stored at Level D.		Right Logo stored at Level D.																																																																						
 <p>Con</p> <p>Information stored in the <u>Tag ITR</u>.</p> 																																																																								
<p>Tag No. 076-E3981</p> <p>Loop No</p> <p>Equipment Description Instrument Cable 1Pr x 1.5mm<sup>2</sup></p> <p>System FM-028 - Training Fraser - import/export 2</p> <p>Subsystem FM-028-089 - Training subsystem</p> <p>Location Offshore - Offshore</p> <p>Manufacturer Manufacturer</p> <p>Termination Drawing</p> <p>Data Sheet Data Sheet No 12345</p> <p>Volt</p> <table border="1"> <tr> <td>Type</td> <td>Model No 12345</td> <td>Core</td> <td>Size</td> </tr> </table> <p>From: 43-IJB-3014 ESD I.S. Junction Box To: 076-PST1004</p>				Type	Model No 12345	Core	Size																																																																	
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<p><b>Test Equipment</b></p> <table border="1"> <thead> <tr> <th>Make:</th> <th>No.</th> <th>Serial No.</th> </tr> </thead> <tbody> <tr> <td>+</td> <td>1</td> <td>of check</td> </tr> <tr> <td></td> <td>2</td> <td>as per the Cable schedule</td> </tr> <tr> <td></td> <td>3</td> <td>as per the Cable schedule</td> </tr> <tr> <td></td> <td>4</td> <td>correct as per specification</td> </tr> <tr> <td></td> <td>5</td> <td>Cable Meets reviewed.</td> </tr> <tr> <td></td> <td>6</td> <td>Confirm Cable route / destination route and segregation are correct</td> </tr> <tr> <td></td> <td>7</td> <td>Check cable supports, cleating and banding are to Project specification</td> </tr> <tr> <td></td> <td>8</td> <td>Check bending radius is within manufacturers and Project specification</td> </tr> <tr> <td></td> <td>9</td> <td>Check Cable markers are correct at transits and at each end</td> </tr> <tr> <td></td> <td>10</td> <td>Check Conductor continuity / phasing is correct, cores to earth, earth to armour</td> </tr> <tr> <td></td> <td>11</td> <td>With all cores disconnected, test / record insulation values for core to core</td> <td>1000MΩ</td> </tr> <tr> <td></td> <td>12</td> <td>With all cores disconnected, test / record insulation values for core to earth</td> <td>1000MΩ</td> </tr> <tr> <td></td> <td>13</td> <td>With all cores disconnected, test / record insulation values for core to screen</td> <td>1000MΩ</td> </tr> <tr> <td></td> <td>14</td> <td>Reconnect cable cores and confirm terminations at both ends</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td></td> <td>15</td> <td>Replace covers and check all bolts correct, confirm none are missing</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td></td> <td>16</td> <td>Check Screen is correctly made off to Project specification</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td></td> <td>17</td> <td>Confirm spare core and screens are terminated and earthed to Project specification</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td></td> <td>18</td> <td>Perform Cold Loop check on each Circuit prior to Pre-Commissioning</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td></td> <td>19</td> <td>Red line mark-up complete and attached</td> <td><input checked="" type="checkbox"/></td> </tr> </tbody> </table>				Make:	No.	Serial No.	+	1	of check		2	as per the Cable schedule		3	as per the Cable schedule		4	correct as per specification		5	Cable Meets reviewed.		6	Confirm Cable route / destination route and segregation are correct		7	Check cable supports, cleating and banding are to Project specification		8	Check bending radius is within manufacturers and Project specification		9	Check Cable markers are correct at transits and at each end		10	Check Conductor continuity / phasing is correct, cores to earth, earth to armour		11	With all cores disconnected, test / record insulation values for core to core	1000MΩ		12	With all cores disconnected, test / record insulation values for core to earth	1000MΩ		13	With all cores disconnected, test / record insulation values for core to screen	1000MΩ		14	Reconnect cable cores and confirm terminations at both ends	<input checked="" type="checkbox"/>		15	Replace covers and check all bolts correct, confirm none are missing	<input checked="" type="checkbox"/>		16	Check Screen is correctly made off to Project specification	<input checked="" type="checkbox"/>		17	Confirm spare core and screens are terminated and earthed to Project specification	<input checked="" type="checkbox"/>		18	Perform Cold Loop check on each Circuit prior to Pre-Commissioning	<input checked="" type="checkbox"/>		19	Red line mark-up complete and attached	<input checked="" type="checkbox"/>
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Figure 42. Highlight of the distinction between Digital Document Task (highlighted in orange) and Digital Document Results Task Result (highlighted in blue) as sources of information on a Tag ITR.

## 34.2 Functionality

Digital Document Templates have their own Add/Edit page that allows the Digital Documents to be created. The page is split into the following sections:

- Headers
- Header Table
- Tasks
- Sign Offs
- Settings
- Preview

There is also main functionality that effects the whole Digital Document such as Saving, Cloning and Creating a new Revision of the Digital Document.

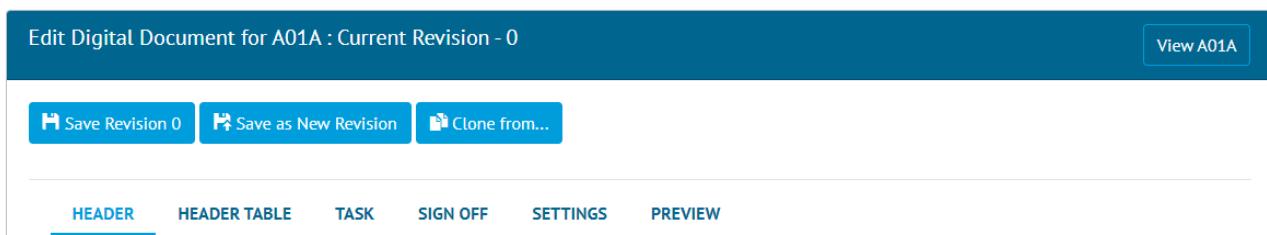


Figure 43. Digital Document Edit Screen controls

### 34.2.1 Saving and Changing a Digital Documents Revision

When Saving a Digital Document, any changes made will change the content for the current active revision. This means that anyone who creates a new item using that template or viewing an existing item which uses the current revision will be changed. If there are items which are currently using the Digital Document no material changes should be made to the Digital Document, as existing revisions will no longer match up to the template.

#### Example

*If we wrote a Digital Document and said Task 1 was to “Verify the use of correct painting materials” but the decision was taken that the first Task should actually be “Review painting guidelines”. If this change was made to an in-progress template, anyone who had completed the document prior to this change will have a tick against “Review painting guidelines” (Task 1) even though this wasn’t part of the process at the time.*

To avoid this a new revision of the document should be created. This will maintain the existing Template for any existing or in progress documents, and the new revision will be used going forward.

### 34.2.2 Revision Section

The Revision section shows all the previous Revisions of a Digital Document and allows old Digital Documents to be restored by selecting them via the Drop Down. Selecting a revision from this drop down will automatically set the document back to that previous revision. This previous revision can then be edited and Saved. If the user requires the old revision to be used as the current revision, they can choose to Save as a New Revision. This will “up-rev” the Digital Document using the old revision as a template.

### 34.2.3 Clone Section

The Clone section will copy the Headers, Tasks and Sign Offs of an existing Digital Document to the Digital Document currently being edited. The user can select from a list of existing Digital Documents of the same Type within the same Level, and the whole content of that Digital Document will be copied across

### 34.2.4 Header Section

The Header Section will be used to add, edit and delete Header Rows, and Header Fields from the Digital Document. The existing rows and fields will be displayed in an editable table.

Row: 5				<input type="button" value="Remove Row"/>
Action	Label	Bookmark	Editable	
<input type="button" value="Remove"/>	Drawing Rev	Tag Source Drawing Revision	<input type="checkbox"/>	
<input type="button" value="Remove"/>	Serial Number	No Bookmark	<input checked="" type="checkbox"/>	
<input type="button" value="Add Column"/>				
<input type="checkbox"/> Repeat Row On New Page				
<input type="button" value="Add Row"/>				

Figure 44. Header Section Controls

The Header Row grid will have the following actions and columns for each row:

UI Element/Field	Type	Description/Path	User Restrictions	Feature Restrictions
Remove	Link	Removes the Field	None	None
Label	Textbox	Input for the Fields display label Header Row: Header Field: Name	None	None
Bookmark	Dropdown	Input for selecting which database field will be used to populate the data on a generated document Header Row: Header Field: Reference	None	Field cannot be editable
Editable	Checkbox	If the field is editable and can be filled in by the user when completing the document. Items which are editable cannot have a Bookmark Field	None	None

Add Column	Button	Adds a new Field to the Field Row.	None	None
Repeat Row on New page	Checkbox	Sets the Repeat on New page field for the Header Row which will repeat the header on every page when generated to PDF.	None	None
Remove Row	Link	Removes the entire Header Row and its Header Fields	None	None

Table 60. **Header Row and Fields Section Grid Actions**

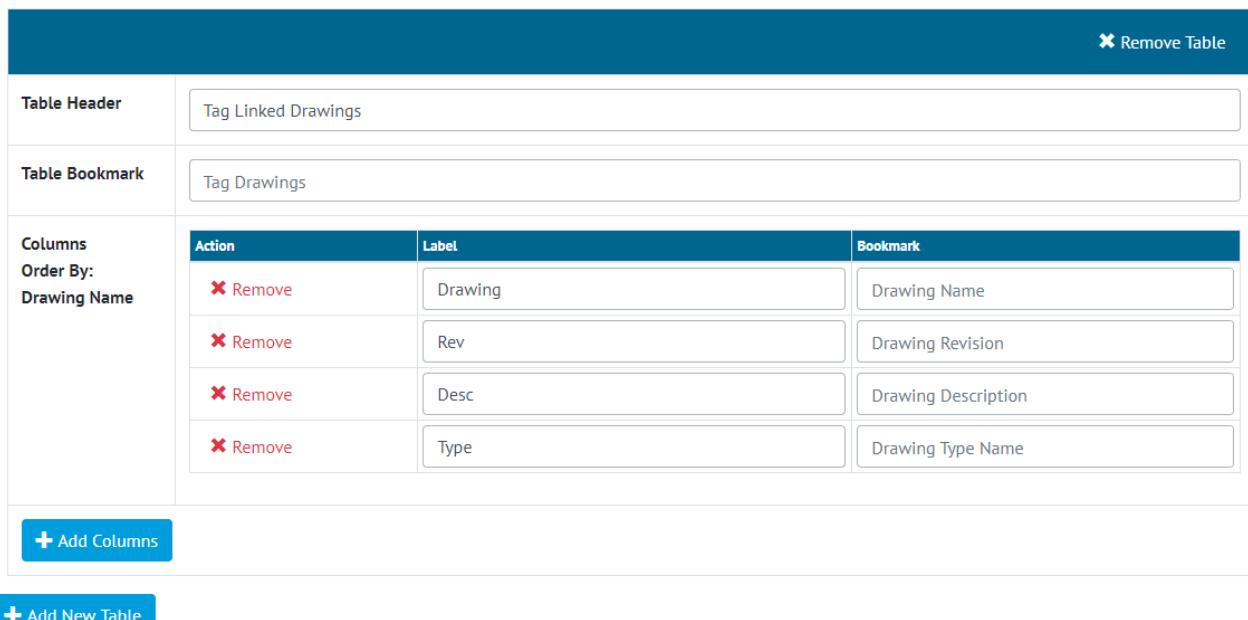
The Header Section will have the following button:

UI Element	Type	Description	User Restrictions	Feature Restrictions
Add Row	Button	Adds a Header row to the Digital Document	None	None

Table 61. **Header Row and Fields Section buttons**

### 34.2.5 Header Table Section

The Header Table Section is used to add, edit and delete table data containing information best shown as a table from the associated item i.e. A table of Tag Sub Systems. The user selects a table to show (Sub Systems) and then can add columns of data for items associated with that table (Name, Description, System). When the document is generated this table will be expanded to show the correct amount of data based on the number of records associated with the result entity.



Action	Label	Bookmark
Remove	Drawing	Drawing Name
Remove	Rev	Drawing Revision
Remove	Desc	Drawing Description
Remove	Type	Drawing Type Name

Figure 45. **Header Table Section Controls**

The Header Table grid will have the following actions and columns for each row:

UI Element/Field	Type	Description/Path	User Restrictions	Feature Restrictions
Remove	Link	Removes the column from the Table	None	None
Table Header	Textbox	Input for the text which will be displayed above the Table when generated	None	None
Label	Textbox	Input for the Column header text.	None	None
Bookmark	Dropdown	Input for selecting which database field will be used to populate the data on a generated document  For the Table this drop down will choose the source for the Table. For each column it will be the source for the column	None	None
Add New Table	Button	Adds a new Header Table to the Document.	None	None
Add Columns	Buttons	Adds a new Column to an existing Table	None	None

Table 62. Header Row and Fields Section Grid Actions

#### 34.2.6 Tasks Section

The Tasks section will be used to add, edit, re-order and delete Tasks from the Digital Document. The existing Tasks will be displayed in an editable table. The Tasks grid will have the following actions and columns for each row:

UI Element/Field	Type	Description/Path	User Restrictions	Feature Restrictions
	Drag and Drop	Allows the Dragging and Dropping of Tasks to reorder them	None	None
Remove	Button	Removes the Task	None	None
Number	Textbox	Input for the Tasks Number  Task: Number	None	None
Task	Textbox	Input the Tasks description/content	None	When Task Type is set to Table this field will default to

		Task: Description		the value of "Task Table". Once saved this Textbox will be disabled.  When Task Type is set to Image this field will default to "Task Image". Once saved this textbox will be hidden.
Task Type	Dropdown	Input the Tasks Type (See Table below)  Task: Task Type	None	None
Add Title	Button	Displays the Title textbox	None	None
Title	Textbox	Input the Tasks Title (which will appear above the Task when generated)  Task: Title	None	None
Required	Checkbox	Input whether the Task is required.  Task: Required	None	When Task Type is set to Table, Image or None (and no comment is configured) this field will default to unchecked. Once saved the checkbox will not be visible.
Configure Table	Link	Navigates to the Add Edit screen for a Task Table.	None	Only visible once a Task has a Task Type of Table and has been saved.
Image Upload	Buttons	Add button to Upload an image. Once an Image is uploaded, the buttons to Download, Delete and Replace the image will appear.	None	Only visible once a Task has a Task Type of Image and has been saved.  Allowed file types: .jpg, .jpeg, .png, .gif.  Max file size: 40MB.

Weighting	Text Box	Input for the weighting of the Task	None	Can only be set on tasks which are not an Image, Table or No Result ability (None with No Comment)
Comment Type	Drop Down	Gives a choice of No Comment, Inline Comment or Long Comment	None	None
Comment Line Length	Text Box	Height of the comment box when shown on screen or in PDF	None	Only visible when Long Comment is chosen from Comment Type
Multiple Choice Configuration	Grid	Add edit and remove multiple choice options, input a label and whether each option will count as complete if selected.	None	Only visibly when the Task Type is Multiple Choice

Table 63. Tasks Section Grid Actions

The following Task Types are available

Task Type	Description
<b>Checkbox</b>	Displays a row of checkboxes, with the user able to select a checkbox for this row
<b>Signature</b>	Adds a section for Signatures at the top and allows the user to enter a Name on the Smart PDF, or shows an Authorised Person Text Box on screen
<b>Date</b>	Adds a Date Column on the Smart PDF with an editable field or Date Picker (on screen) to allow a completed date to be entered.
<b>Combination of 2 of the above</b>	Options are available for choosing two of the three options above (Checkbox and Signature, Checkbox and Date, Signature and Date)
<b>Checkbox, Signature and Date</b>	Combination of Checkbox, Signature and Date
<b>Table</b>	Allows the user to configure a table to display with both static text and textboxes for user input.
<b>Image</b>	Allows an image to be uploaded, which will display on screen and on generated digital documents. Images when uploaded will be automatically scaled to have a maximum width of 800 pixels and a height of 600 pixels to reduce file size for storage. Images smaller than these maximums will not be scaled.

<b>Multiple Choice</b>	Allows the user to select from a list of Drop-Down Options. Each option can be configured to count as complete and options set are on a per Task basis.
<b>None</b>	A static text box that allows a user to enter up to 4000 characters.

Table 64. **Task Type Options**

The following Comment Options are available

Task Type	Description
<b>No Comment</b>	No Comment Row or Column will be added to the Task
<b>Inline Comment</b>	An Inline Comment Row will be added to the Task i.e. It will be inline with the Task Description.  When Inline Comment is selected, and we have Signature, Date and Checkboxes in the Digital Document. The Signature and Date fields will drop down to below the Task on PDF generation.
<b>Long Comment</b>	A Long Comment will appear below the current Task. The Length of this box can be chosen by an additional option called Comment Line Length that appears when this option is selected.

Table 65. **Comment Type Options**

The Tasks Section will have the following UI elements:

UI Element	Type	Description	User Restrictions	Feature Restrictions
Add New Task	Button	Adds a Task row to the Task Grid.	None	None
Add Multiple Tasks	Button / Dropdown	An additional drop down next to the Add New Task that changes the button to add multiple tasks and allows the user to specify the number of Tasks to Add	None	None
Checkbox Options	Dropdown	Selects the Digital Document Checkbox Type. Options populated from the Digital Document Check Box Type reference table.	None	None

Table 66. **Fields Section Elements**

### 34.2.7 Sign Offs Section

The Sign off section use the same controls as the Flexible Sign Off.

### 34.2.8 Settings Section

The Settings section will allow functional settings about the Digital Document to be configured.

The Settings section will have the following UI elements:

UI Element	Type	Description	User Restrictions	Feature Restrictions
Orientation	Dropdown	Sets the page orientation of the <u>Digital Document</u> for PDF generation	None	None
Hide Comments	Selector	Shows/hides the comments section on a generated digital document. (This does not apply to individual tasks which have a comments input)	None	Comments will be shown by default

Table 67. **Settings Section elements**

### 34.2.9 Preview Section

The preview section will display an on-page, read-only representation of the Digital Document. There will be the Digital Document Title, followed by the Headers, Tasks, Comments area, Sign Offs and Revision details.

### 34.2.10 Task Table Add and Edit

The Task Table Add Edit page will allow users the ability to add and edit each of the Task Table components (Rows, & Cells) as well as preview what the generated Task Table would appear like.

The Add/Edit page will have the following buttons:

UI Element	Type	Description	User Restrictions	Feature Restrictions
Save	Button	Attempts to Save the Task Table.	Digital Document Edit Permissions – Will depending on the Type of Digital Document	None
Add New Row	Button	Adds a new Row with a single Cell which has its editable field set to false.	None	None
Copy Row	Button	Adds a new Row copying all the properties and Cells of the Row above it.	None	None

Add Empty Row	Button	Adds a new Row copying the number and widths of Cells of the Row above it. All Cells will have empty prefix, suffix and static text fields and will be editable.	None	None
---------------	--------	--	------	------

Table 68. **Task Table Add Edit page buttons**

Each Row on the Task Table Add Edit page will have the following elements:

UI Element/Field	Type	Description	User Restrictions	Feature Restrictions
Is Header	Checkbox	Sets the Header Field for the Row. When set to true the Cells will have a thicker border and bold font weight.	None	None
Remove Row	Link	Deletes the current Row and its Cells.	None	None
Add Cell	Button	Adds a new Cell to the current Row. If the current Row's Header field is false, then the new Cell's editable field will default to true.	None	None

Table 69. **Table Row elements**

Each Cell in a Table Row will have the following elements:

UI Element/Field	Type	Description	User Restrictions	Feature Restrictions
Remove	Link	Deletes the current Cell	None	None
Editable	Checkbox	Sets the Editable field for the Cell. Editable fields will have a Textbox for the user to populate when the Digital Document is generated.	None	None
Static Text	Textbox	Populated the Static Text field for the current Cell. Static Text is used to place text into non-editable fields on the generated Digital Document.	None	None



Prefix	Textbox	Populated the Prefix field for the current Cell. Prefix is used to place text before Static Text or the editable textbox on the generated Digital Document.	None	None
Suffix	Textbox	Populated the Suffix field for the current Cell. Suffix is used to place text after Static Text or the editable textbox on the generated Digital Document.	None	None
Width	Numeric Textbox	Populates the Width field of the current Cell. Width will change how many columns a cell spans.	None	None

Table 70. **Table Cell elements**

There will be a limit of 50 rows and 15 columns (per row) in a Task Table. Once these limits are reached, no further rows or columns can be added to the table, and the corresponding buttons will be disabled. The columns limit is increased to 20 if the Digital Document has its Orientation set to Landscape.

### 34.2.11 Footers

Digital Documents will have a Footer printed on each page. These are configurable via the Level C administration page. There can only be one Footer configuration for each Level C which will apply to each Digital Document Type. There can be three elements on a Footer, one for each area: Left, Centre, and Right. The options available is any combination of the following type: Text, Page Number, Document Revision, and Generated Date. If no Footer is configured for the Level C then the default footer output will be: Left: Page Number, Centre: Generated Date, Right: Revision.

## 34.3 Validation & Business Rules

### 34.3.1 Headers

There cannot be more than 10 Fields in any Header Row.

There must be a selected bookmark for non-editable Header Fields.

Label must be populated for Header Fields

### 34.3.2 Header Tables

A Header Table cannot contain duplicate bookmarks.

A Header Table cannot have more than 10 columns.



Table Header cannot be longer than 50 characters.

All columns must have a populated Label.

### 34.3.3 Tasks

Comment line length must be between 1 and 20.

Each multiple choice option must have a unique label within a Multiple Choice Task.

At least one multiple choice option must have its Count as Complete field set to true within a Multiple Choice Task.

### 34.3.4 Task Table

All Table Rows must contain a minimum of one Table Cell.

Each Table Row's Table Cell's Width's must total the same amount (E.G. 4 Table Cells with Widths: 1;1;1;1 and another Table Row with 3 Table Cells with Widths: 1;1;2 is valid as both rows total widths equals 4).

Table Cell cannot have a populated Static Text field if its Editable field is set to true.

### 34.3.5 Digital Document Check Box Type

Only one Digital Document Check Box Type can have its Is Default field set to true within a Level B.

Attempting to set two Digital Document Check Box Types to have a true value for Is Default within the same Level B will cause a validation warning to appear.

If there are any Tasks which have a checkbox then a Checkbox Type must be selected.

### 34.3.6 Document Task Weighting

The Task Weighting field must be a numerical value with a maximum of two decimal places between the range of zero and one hundred.

### 34.3.7 Mandatory Save as New Revision

If a Digital Document is being used and there are corresponding Digital Document Results linked to the current revision, the following edits to a Digital Document will require a New Revision to be made to successfully save the changes:

Increasing or deleting the number of editable Header Fields.

Changing a Header Field from editable to not editable and vice versa.

Adding or deleting Tasks.

Changing the Checkbox Type.

Changing the weighting of a Task.

Changing the type of a Task.

Changing the multiple choice options of a Multiple Choice Task.





Adding or deleting Sign Offs.

Changing which Sign Off is of type Complete.

## 35 Digital Document – Progress & Generation

### 35.1 Definition

Entities which have been configured to use Digital Documents for certification can progress and complete the documents on screen, by generating as a PDF file, or via the GoTechnology Companion App or a combination of all three. When using PDF files, the populated files can be uploaded via the Upload Digital Document section, which will then extract the data and store this against the Digital Document Result. Completing via the Companion App will save the information in hub2 when the user chooses to upload from the app.

### 35.2 Functionality

Digital Document Result is the data structure which will be used to store the various components of a completed Digital Document. It is made up from Header Field Results, Task Results, Sign Off Results and Comments.

On any Entity with a Digital Document, a Digital Document Panel will appear allowing quick access to the on-screen edit screen and to generate the PDF.



Figure 46. Example of a Digital Document Panel

#### 35.2.1 On Screen

The Document Edit page allows the user to edit and complete a Digital Document Result. The page will display all elements of the Digital Document: Header Fields; Header Tables; Tasks; Comments; Sign Offs, with controls to allow the population of all editable sections.

All Tasks can have an Images attached to them. Each task will have buttons for adding, viewing, downloading and deleting images.

As tasks are completed, the Task progress bar updates dynamically.

00-AC-AIB-001 - A01A - Architectural Outfitting (Revision 0) View 00-AC-AIB-001 - A01A

Save Generate as PDF Delete

Details											
<b>Tag No.</b> 00-AC-AIB-001 <b>System No.</b> AL-045 <b>Location</b> <b>Description</b> ACS JUNCTION BOX <b>Drawing Refrence</b> <div style="border: 1px solid #ccc; height: 20px; margin-top: 5px;"></div>	<b>Pack No.</b> AL01-00018 <b>Subsystem No.</b> AL-045-501 <b>Rev.</b> <div style="border: 1px solid #ccc; height: 20px; margin-top: 5px;"></div>										
<b>Task Progress</b> <span style="float: right;">100.00%</span> <div style="width: 100%; background-color: #0070C0; height: 10px; margin-top: 5px;"></div>											
<b>Tasks</b> <span style="float: right;">Show All Tasks   Collapse All Tasks</span> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">1 - Raised access floor complete.</td> <td style="text-align: right; padding: 5px;">OK</td> </tr> <tr> <td style="padding: 5px;">Task Result:</td> <td style="text-align: right; padding: 5px;"> <span style="border: 1px solid #0070C0; padding: 2px 5px; margin-right: 5px;">OK</span> <span style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 5px;">NA</span> <span style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 5px;">PL</span> <span style="border: 1px solid #0070C0; padding: 2px 5px; background-color: #0070C0; color: white;">×</span> </td> </tr> <tr> <td colspan="2" style="text-align: center; padding: 5px;"><a href="#">Add Image</a></td> </tr> <tr> <td style="padding: 5px;">2 - False ceiling complete.</td> <td style="text-align: right; padding: 5px;">OK</td> </tr> <tr> <td style="padding: 5px;">Task Result:</td> <td style="text-align: right; padding: 5px;"> <span style="border: 1px solid #0070C0; padding: 2px 5px; margin-right: 5px;">OK</span> <span style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 5px;">NA</span> <span style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 5px;">PL</span> <span style="border: 1px solid #0070C0; padding: 2px 5px; background-color: #0070C0; color: white;">×</span> </td> </tr> </table>		1 - Raised access floor complete.	OK	Task Result:	<span style="border: 1px solid #0070C0; padding: 2px 5px; margin-right: 5px;">OK</span> <span style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 5px;">NA</span> <span style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 5px;">PL</span> <span style="border: 1px solid #0070C0; padding: 2px 5px; background-color: #0070C0; color: white;">×</span>	<a href="#">Add Image</a>		2 - False ceiling complete.	OK	Task Result:	<span style="border: 1px solid #0070C0; padding: 2px 5px; margin-right: 5px;">OK</span> <span style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 5px;">NA</span> <span style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 5px;">PL</span> <span style="border: 1px solid #0070C0; padding: 2px 5px; background-color: #0070C0; color: white;">×</span>
1 - Raised access floor complete.	OK										
Task Result:	<span style="border: 1px solid #0070C0; padding: 2px 5px; margin-right: 5px;">OK</span> <span style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 5px;">NA</span> <span style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 5px;">PL</span> <span style="border: 1px solid #0070C0; padding: 2px 5px; background-color: #0070C0; color: white;">×</span>										
<a href="#">Add Image</a>											
2 - False ceiling complete.	OK										
Task Result:	<span style="border: 1px solid #0070C0; padding: 2px 5px; margin-right: 5px;">OK</span> <span style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 5px;">NA</span> <span style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 5px;">PL</span> <span style="border: 1px solid #0070C0; padding: 2px 5px; background-color: #0070C0; color: white;">×</span>										

Figure 47. Digital Document Result Edit Screen – Header Fields and Tasks

22 - Internal doors complete.

OK

Task Result:

OK NA PL X

[Add Image](#) [Show Images \(2\)](#) [Download Images \(2\)](#)

---

**Comments**

---

**Sign Offs**

<b>Completed By</b> <input type="text" value="Anastasija"/> <span style="border: 1px solid #ccc; padding: 2px;">Q</span>	<b>Completed Date</b> <input type="text" value="14/02/2020"/>
<b>Accepted By</b> <input type="text" value="Rupal"/> <span style="border: 1px solid #ccc; padding: 2px;">Q</span>	<b>Accepted Date</b> <input type="text" value="19/02/2020"/>
<b>Approved By</b> <input type="text" value="Anastasija"/> <span style="border: 1px solid #ccc; padding: 2px;">Q</span>	<b>Approved Date</b> <input type="text" value="19/02/2020"/>

Save Generate as PDF Delete

Figure 48. Digital Document Result Edit Screen – Comments and Sign Offs

The Digital Document Result Edit screen will have the following buttons and controls:

UI Element	Type	Description	User Restrictions	Restrictions
Save	Button	Attempts to save the current content of the Document. If the content is valid then the save will be successful. If the content is invalid the save will not proceed and validation messages will be displayed to the user.	Digital Document Results – Add or Edit Permission – Will depend on type of Digital Document	None
Generate as PDF	Button	Generates the Digital Document as a PDF populated with any Digital Document Result data for the current document	Digital Document Results – Read Permission – Will depend on type of Digital Document	None

Delete	Button	Deleted the current Digital Document Result, and navigates back to the View page of the corresponding entity i.e. Tag ITR View page	Digital Document Results – Delete Permission – Will depend on type of Digital Document	Only visible once some Digital Document Result Data has been saved.
Add Image	Button	Below each Task allows Images to be added to the Digital Document Task	Digital Document Edit Permission – Will depend on type of Digital Document	Allowed file types: .jpg, .jpeg, .png, .gif.  Max file size: 40MB.  The Digital Document must be saved before images can be added.
Show Image(s)	Button	Brings up an Image Viewer that allows all Images for a given Task to be viewed and with delete button to delete it	None	At least one image much be Attached
Download Image(s)	Button	Downloads all the Images for a given Task	None	At least one image much be Attached

Table 71. **Digital Document on screen Actions**

The Image Preview screen allows the user to view any images have been attached to the Task. If there are more than one Image Attached to the document, then arrow buttons will allow the images to be navigated through. There is a delete image button which will allow the user to delete the current image.



**Figure 49. Screenshot of the Image Preview Dialogue with an example picture**

The following buttons and controls are available in the image preview:

UI Element	Type	Description	User Restrictions	Restrictions
	Button	Moves to the previous image.	None	None
	Button	Moves to the next image.	Digital Document Results – Read Permission – Will depend on type of Digital Document	None
Delete Image	Button	Deletes the Current Image. Image will still be displayed on screen till the dialogue is closed or another image is selected.	Digital Document – Results – Edit – Will depend on type of Digital Document	None
	Button	Closes the Image Preview Dialogue	None	None

**Table 72. Digital Document Image Panel Functionality**

### 35.2.2 PDF

QED-C01A						VQCVXM
		ITR Desc				
Tag		076-FT-1005				
No.	Description of Task		Comments	OK	NA	PL
1	Checkbox			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Inline Comment					
3	3 Line Comment Comments:					
4	Checkbox Comment			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Date Date:					
6	Date Checkbox Date:			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Date Signature Date: Signature:					
8	Date Signature and Checkbox Date: Signature:			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Date Signature and Comment Date: Signature:					
Text Only Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Nulla facilisi cras fermentum odio eu. Lobortis scelerisque fermentum dui faucibus in ornare quam viverra orci. Morbi tincidunt ornare massa egert egestas purus viverra accumsan. Massa eget egestas purus viverra accumsan in nisl. Facilisis gravida neque convallis a cras semper auctor neque vitae. Voluptat est velit egestas dui id. Ac turpis egestas integer eget aliquet nibh praesent tristique. Pellentesque sit amet portitor eget. Aliquam sem et tortor consequat id porta nibh venenatis cras. Eleifend donec pretium vulputate sapien nec sagittis aliquam malesuada. Elementum nibh tellus molestie nunc non. Natoque penatibus et magnis dis parturient montes nascetur. Quis risus sed						

Figure 50. Example of a Generated PDF

The Digital Documents can also be edited in PDF format. This will produce the document in a “Smart” PDF format where the Tasks can be completed by the user in the PDF. These PDFs can be saved, emailed and then returned to a user allowing offline access to the Templates but still allow them to be uploaded and validated electronically.

User input into the PDF will only be validated at the point the PDF file is uploaded to hub2.

Any images attached to the Tasks when completing the document via the screen, will be displayed at the end of the Document, in a table with the associated Task displayed in the left column.

Each Document that will be produced in hub2 will have a 6 letter Document Code (see Section 17) and when the document is generated in PDF format this barcode will be displayed on the top right of the Digital Document.

All Barcodes will be in PDF417 format like below.



Figure 51. Example of a PDF417 Barcode

The logos produced on the PDF are based on the logos set in the Level D\_admin page.

### 35.2.3 Upload Digital Documents

The Upload Digital Documents page will be used to extract Digital Document Result data from PDF versions of generated Digital Documents. Digital copies of the PDFs will not be stored as part of the functionality of this page, that would be covered by the Attachment Upload functionality.

Once PDF Files of the Digital Documents have been selected, the page will perform some basic validation to ensure all Document Tasks have a valid Task Result and that all Document Sign Offs have a valid Sign Off Result. Partially complete Digital Documents will be allowed; however, all required Document Tasks must be populated if there are any Sign Off Results populated. Validation warnings will be displayed to indicate if any of the data in the PDF is invalid.

Documents Pending Upload indicates the number of documents to be uploaded, maximum 20 documents can be selected and uploaded at a time. Uploading progress can be seen in the progress bar.

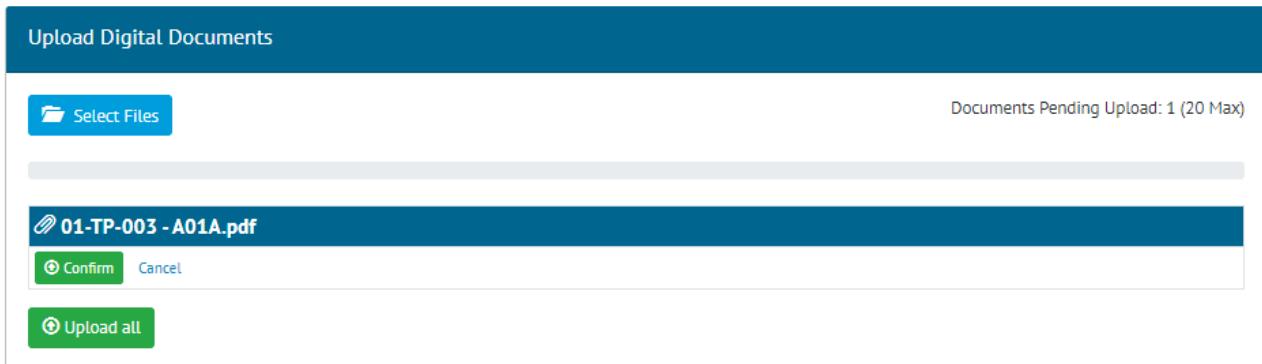


Figure 52. Example of Upload Digital Document

The buttons on the Upload Digital Document screen are:

UI Element	Type	Description	User Restrictions	Restrictions
Select Files	Button	Displays the File Select dialogue.	None	None
Upload All	Button	Uploads all the documents currently displayed on the page.	None	None
Confirm	Button	Confirms a single document and uploads it	None	None
Cancel	Button	Removes a document from the upload page	None	None

Table 73. Upload Digital Document page buttons

### 35.3 Validation & Business Rules

#### 35.3.1 Digital Document Result

All required Document Tasks must have a populated Task Result before any Document Sign Offs Results can be populated.

The Date fields cannot be set in the future.

### 35.3.2 Sign Off Result

Sign Offs Results dates must be in order. So, a Sign Off with an Order of 1 cannot have a date set prior to the Sign Off with order 0.

When populating a Sign Off of Type: Complete all Sign Offs of Type: Required must be populated.

Sign Off Dates cannot be set in the future.

### 35.3.3 Task Image Result

Only the following file types are allowed, and the file must not be larger than 40MB

- .jpg
- .jpeg
- .png
- .gif.

## 36 DOTX Templates

### 36.1 Definition

Projects using the traditional paper-based approach to certification, require the use of DOTX templates. An entity is assigned a template, which on generation produces a DOCX file populated with the required information.

Completed paper-based documents are scanned, then attached back to the target object using either the standard attachment functionality, or via barcodes bookmarked onto the document. User inputs to the DOCX file after generation are not extractable and will not be uploaded back into the database.

The following sections make use of DOTX Templates

- Tag ITR – Templates stored at ITR Level
- Tag PWL – Templates stored at PWL Level
- MOC – Templates stored at MOC Type Level
- Handover – Templates stored at Handover Type Level

For those sections that use DOTX and Digital Documents templates, only one template can be used at a time. There is a drop down on a per item basis to switch between Digital Document or DOTX Template i.e. for each ITR the Template Method can be chosen.

### 36.2 Functionality

#### 36.2.1 Bookmarks

Bookmarks are used within the DOTX templates to specify what and where information from hub2 should be populated on a generated DOCX file. Bookmarks in the DOTX files can be seen in the example below:

A09B Architectural		I
I	Pre-Commissioning Galley Equipment	I
Tag No.	I	
Equipment Description	I	
System	I - I	
Subsystem	I - I	
Location	I - I	
Drawing No.	I	
No.	Description of check	OK
1	Confirm the relevant "A" sheets have been completed and no 'A' punch list items are outstanding.	<input type="checkbox"/>
2	Visually inspect and confirm compliance with latest arrangement drawing.	<input type="checkbox"/>
3	De-preservation carried out as detailed in the commissioning procedure.	<input type="checkbox"/>
	N/A	
	P/L	

Figure 53. DOTX Template with Bookmarks

On DOCX file generation, bookmarks are populated with the corresponding information from hub2, similarly to what can be seen in the figure below:

A09B Architectural		[REDACTED]		
<b>DEMO Greenfield</b>	<b>Pre-Commissioning Galley Equipment</b>	I		
Tag No.	GFD-Tag/01			
Equipment Description	Greenfield Demo Tag/01			
System	System10 - System10			
Subsystem	Sub System10 - Sub System10			
Location	Location10 - Location10			
Drawing No.	Drawing1			
No.	Description of check	OK	N/A	P/L
1	Confirm the relevant "A" sheets have been completed and no 'A' punch list items are outstanding.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Visually inspect and confirm compliance with latest arrangement drawing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	De-preservation carried out as detailed in the commissioning procedure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	-----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 54. DOCX file with populated Bookmarks

The format of the bookmarks for document generation follows the actual property path of each field as seen in the example:

bmTaggedItemDisciplineDescription : Tag ITR -> Tagged Item -> Discipline: Description

Using the full path is beneficial as no additional work is required to create bookmarks when new entities and fields are added to the database.

### 36.2.1.1 Bookmark Rules

There are rules that allow optional, shorter bookmarks to be used in addition to the full bookmarks

Original Value	Replacement Value
Name	No
Description	Desc
Sub System System	System
Secondary Handover Primary Handover	Primary Handover
Tagged Item	Tag

Table 74. Bookmark Replacement Matrix

Furthermore, Name can be missed out completely when dealing with an item from a Reference or other table e.g. Tag's Discipline Name would use "TagDiscipline" and the system will automatically work out Discipline's Name is required.

Custom Fields operate in the same way as regular bookmarks and are available for selection alongside the normal fields. However, if the user changes the name of a Custom Field, the bookmark may stop working and will need to be reset.

It is not possible for every field to be presented as a bookmark, some notable exceptions include:

- Items that are Lists within Lists i.e. Test Pack Lines Sub Systems.
- Most of the fields on the Mechanical Joints Line, including the Lines Custom Fields.

### **36.2.1.2 Multi Tag ITR Bookmarks**

Multi Tag Bookmarks work similarly, except each value is replaced by a Comma Separated Value representing all the selected items. For example, if four Tags are selected, the bookmark `bmTagName` will be displayed as each of the Tag Names separated by a comma.

These documents do not have their own Document Code (since one Document Code corresponds to one Tag ITR). However, barcodes are still generated, allowing them to be uploaded in the same way as any barcode document and they will be associated with all the Tag ITRs included in the generated document.

### **36.2.1.3 Table Bookmarks**

Table bookmarks can each have multiple values, populating multiple rows on a table and therefore differ slightly to normal bookmarks. Usually the path to the intended item is all that is required. For example, the Tag Equipment Type's Name bookmark is “`TagEquipmentTypeName`”. For tables, two bookmarks are required; The table bookmark which defines what type of table we want to display, and a column bookmark which defines what property of that table we want to view.

The table bookmark is split out by a “\_” into three parts. The first part is always “`tbl`” and tells us we are dealing with a table bookmark. The second part is a unique and distinct name for this table within the document. This can be as simple as “`Table1`” and allows the columns associated with this table to be found. The third part is the path to the table. For example, the Tag Sub System Table would use “`TagSubSystem`”. This would make the table bookmark “`tbl_Table1_TagSubSystem`”.

The column bookmark is also divided into 3 parts by a “\_” and defines a single column within the table. Column bookmarks begin with “`col`”, and use the same distinct table name from the table bookmark for the second part i.e. “`Table1`”. The third part is the path from the table to the property we want to use, for example “`SubSystemName`”. This would make a column bookmark “`col_Table1_SubSystemName`”

We can have multiple column bookmarks for the same table and each one should match a column in a Word Document table. This allows us to put as much or as little information as needed onto one table.

Custom Fields are not available for use as Table Bookmarks.

#### **36.2.1.3.1 Loop Tags Table**

When an ITR is assigned to one Tag, the “Loop Tags” table lists all the Tags that contain the same Loop. The ordering is mandated by the Loop Element field, regardless of whether it is a column within the table.

#### **36.2.1.4 Bookmark Conversion and Aliasing**

There is no conversion or aliasing of bookmarks at present.

#### **36.2.1.5 Bookmark List**

A list of recommended bookmarks is available on each entity that uses DOTX Templates. This bookmark list is specific to the current project and contains bookmarks for any Custom Fields associated with the element i.e. The Tag ITR bookmark list contains the Tags Custom Fields bookmarks.



### 36.2.2 Validating Bookmarks

The Validate button on each entity will check the bookmarks on a DOTX Template have been populated correctly. If the user has entered a valid bookmark, the system will recognise this and display the path of the item that will be output.

Bookmark Validation	
bmBarcode	Valid
bmLogoLeft	Valid
bmLogoRight	Valid
bmTagNo	Valid - TaggedItem -> Name
bmTagDesc	Valid - TaggedItem -> Description
bmSystem	Valid - TaggedItem -> TagSubSystems -> SubSystem -> System -> Name
bmSystemDesc	Valid - TaggedItem -> TagSubSystems -> SubSystem -> System -> Description
bmSubSystem	Valid - TaggedItem -> TagSubSystems -> SubSystem -> Name
bmSubSystemDesc	Valid - TaggedItem -> TagSubSystems -> SubSystem -> Description
bmLocation	Valid - TaggedItem -> Location -> Name
bmLocationDesc	Valid - TaggedItem -> Location -> Description
bmDrawing	Ambiguous Bookmark: Path might be TaggedItem -> SourceDrawing -> Name or TaggedItem -> TagDrawings -> Drawing -> Name

OK

Figure 55. Example of a QED-A01A being validated

### 36.2.3 Barcoding

Each document produced in hub2 has a 6 letter Document Code (see Section 18). On document generation a barcode is created from the Document Code and displayed, the placement of which based on the “Barcode” bookmark.

All Barcodes are in PDF417 format like below.



Figure 56. Example of a PDF417 Barcode

### 36.2.4 Logos

The logos produced on the DOTX Template are based on the logos set in the Level D\_admin page. There are two bookmarks for these logos; LogoLeft and LogoRight. Each adds in the specific logo based on the bookmark's placement.

### 36.2.5 Access to DOTX Templates

When the template method is set to DOTX, a button is made available on Reference Table view pages to upload one DOTX template at a time. Once uploaded the template can be downloaded via the same page.

wood.

## 37 Cover Sheets

### 37.1 Definition

A Cover Sheet is the first document generated within Handover and Work Pack Dossiers. For Work Pack Dossiers, it may contain information about a Work Pack or the Work Pack Type, and similarly for Handover Dossiers it may contain information about the Handover or Handover Type. The information is presented via bookmark rows and tables.

### 37.2 Functionality

#### 37.2.1 Cover Sheet Add Edit

The Cover Sheet Add Edit page allows users to add and edit each of the Document's components (rows, tables and logos) as well as preview how the generated document would appear.

The Add/Edit page contains the following buttons:

UI Element	Type	Description	User Restrictions	Feature Restrictions
Save	Button	Saves the Cover Sheet.	Cover Sheet Create or Edit Permissions	Only visible for an existing Cover Sheet.
Rows	Button	Displays the Row Edit Section.	None	None
Tables	Button	Displays the Table Edit Section.	None	None
Logos	Button	Displays the Logo Edit Section.	None	None
Preview	Button	Displays the preview section.	None	None

Table 75. **Cover Sheet Add Edit Buttons**

##### 37.2.1.1 Rows section

The Rows Section is used to add, edit and delete Reference Rows from the Cover Sheet. The existing rows and fields are displayed in an editable table. The Reference Row grid contains the following actions and columns for each row:

UI Element/Field	Type	Description/Path	User Restrictions	Feature Restrictions
Remove	Button	Removes the Reference Row	None	None
Label	Textbox	Input for the Reference display label	None	None



Bookmark	Dropdown	Input for selecting which database field will be used to populate the data on a generated document	None	Field cannot be editable
Add Column	Button	Adds a new Column to the Row	None	None
Remove Row	Button	Removes the entire Row and its Fields	None	None

Table 76. **Cover Sheet Rows Section Buttons**

The Rows Section will have the following buttons:

UI Element	Type	Description	User Restrictions	Feature Restrictions
Add New Row	Button	Adds a row to the Row Grid	None	None
Row Font Size	Textbox	Input for the Row font size	Must be a value greater than 0 and less than 60.	None

Table 77. **Reference Row and Fields Section buttons**

#### 37.2.1.1.2 Table Section

The Table Section is used to add, edit and delete table data containing information best shown as a Table from the associated item e.g. a table of Tag Sub Systems. The user selects a Table to show (Sub Systems) and then can add columns of data for items associated with that table (e.g. Name, Description, System). When the document is generated this table will be expanded to show the correct amount of data based on the number of rows of data required.

The Table grid will have the following actions and columns for each row:

UI Element/Field	Type	Description/Path	User Restrictions	Feature Restrictions
Remove	Button	Removes the Field Table or Column depending on selection	None	None
Label	Textbox	Input the Name of the Table or Column. The Table Header will appear above the Table. The label for a column will appear above the corresponding column	None	None
Bookmark	Dropdown	Input for selecting which database field will be used to populate the data on a generated document	None	None

		For the Table this drop down will choose the source for the Table. For each column it will be the source for the column.		
Add New Table	Button	Adds a new Table to the Document.	None	None
Add Columns	Buttons	Adds a new Column to an existing Table	None	None

Table 78. **Table Row and Fields Section Grid Actions**

### 37.2.2 Cover Sheet Preview

The Cover Sheet Preview page will display a read only representation of the Cover Sheet. There will be the Cover Sheet Title, followed by the Rows, Row Tables and the footer.

## 38 Data Change Logging (History)

### 38.1 Definition

hub2 contains an Audit Trail showing the complete history of changes made to each Entity Type. The software logs creation, modification and deletion of each Entity type along with the name of the User who made the change and the date and time the change took place. A History button on the View screen for most Entities allows users to see the timeline of changes that were made to the record, along with information about the fields that were changed at the time.

### 38.2 Pages

#### 38.2.1 Entity History page

Within the View page for each Entity, a button labelled: 'History' enables navigation to the Entity History page for the Entity.

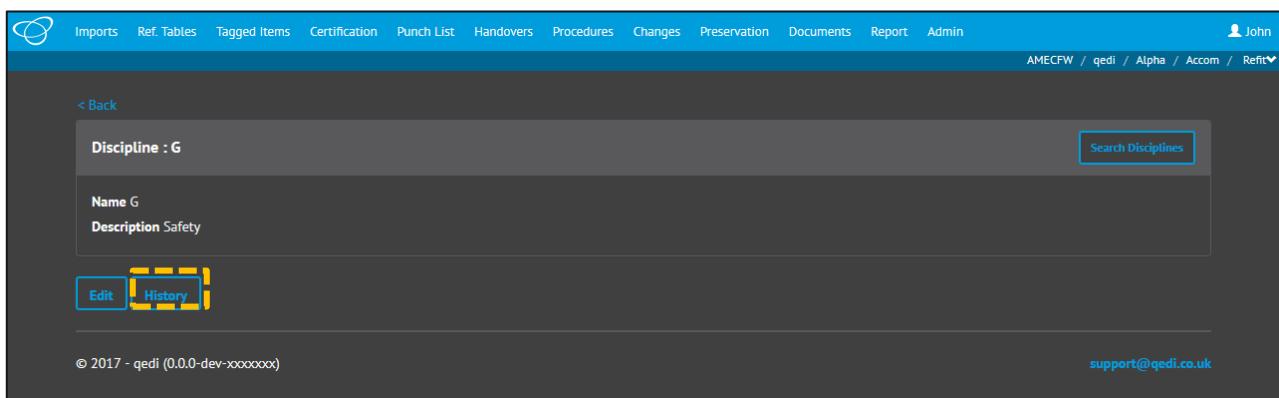


Figure 57. Screenshot of an Entity View page

Change History				<a href="#">View V</a>
Name V				<input type="checkbox"/> Show Dates
Action	Date	User	Changes	
Updated	a few seconds ago	Anastasija Novak	Description - Example Discipline + Updated Discipline	
Added	4 minutes ago	Anastasija Novak		

Figure 58. Screenshot of an Entity History page

The Entity History page will contain a table displaying the list of events that have taken place for the Entity, starting with the record being created and including all changes which have taken place since.

Field	Path	Type	Sortable
Action	Action	Text	No
Date	Date	Text	Yes
User	User Name (from ID)	Text	No
Changes	Field Changes	Text – List of field changes (if applicable)	No

Table 79. History Event table on Entity History page

UI Element	Type	Description	User Restrictions	Feature Restrictions
Show Dates	Check Box	When checked, the date of each event is displayed instead of the “time ago” text	None	None

Table 80. UI Elements on Entity History page

The History Event table supports paging to allow history with many events to be displayed efficiently.

By default, the Date column is shown in a user-friendly format to make it easier to see how recently the changes were made, e.g. “2 minutes ago”, “4 months ago” etc. Clicking the ‘Show Dates’ checkbox toggles the column to show the actual dates and times instead. In addition, hovering the cursor over the user-friendly date shows the actual date and time in a tooltip for convenience.

### 38.3 Validation & Business Rules

Since history records are recorded automatically without user interaction, there is no specific validation stage required when they are created and updated.

## 39 Imports and Exports

### 39.1 Definition

The Import feature in hub2 allows data of each entity type to be bulk imported using pre-formatted templates available from within the software. These can be downloaded as either blank sheets or pre-populated with the existing set of data via the Export facility. In either case the files can then be edited using a spreadsheet utility such as Microsoft Excel and import back into the system to add, alter or remove existing information or records.

The Import feature also allows data to be transferred from other software applications if it can be presented in an acceptable format.

Once an Import has been successfully validated and processed, a results file detailing the outcome of the Import is available for the user to review.

#### 39.1.1 Import Sheets

The Import section is designed to allow data to be imported into hub2 from two different file formats.

- CSV (Comma-Separated Values)
- XLSX (Microsoft Excel Open XML)

It is not necessary to include all columns for the Entity on an import sheet, however all Entities have one or more Unique Identifying columns (e.g. "Name") which must be included. When data is imported, any missing columns will retain the same value when records are updated, or remain unset when records are added. When adding a new record, columns for all required fields must be included in the sheet and must be completed, otherwise the record will fail.

#### 39.1.2 Importing in CSV

When importing in CSV the first row is treated as the header row, and each additional row is treated as a record to be imported.

The order of fields in each row should be consistent with a new field separated by a comma (","). For example, the Subsystem import will contain 3 columns of information: Name, Description and System Name (referred to simply as "System"). The CSV file should look like this:

Name, Description, System
AL-040-501, ALPHA LP Separator, AL-040
AL-048-501, Production Gas Scrubber, AL-048
AL-055-501, Injection Compressor, AL-055
AL-055-502, Injection Compressor, AL-055

Figure 59. Example CSV File

#### 39.1.3 Importing in XLSX

XLSX is an XML Spreadsheet Format used by Microsoft Excel and other compatible software. When importing in XLSX the first row is treated as the header row, with each column corresponding to a field to



be imported, each additional row is treated as a record to be imported with the field values corresponding to the header row.

For example, the Sub System import will contain 3 columns of information: Name, Description and System Name (referred to simply as “System”). The XLSX file should look like this:

Name	Description	System
AL-040-501	ALPHA LP Separator	AL-040
AL-048-501	Production Gas Scrubber	AL-048
AL-055-501	Injection Compressor	AL-055
AL-055-502	Injection Compressor	AL-055

Figure 60. **Example XLSX File**

If an XLSX sheet has more than 5 consecutive rows that don't contain any data then the software will stop checking for new rows after this, meaning that if there some large gaps between data some data may not be imported.

### 39.1.4 Import Settings

Imports can be performed using one of the following settings:

- Validation
- Simulation
- Full

#### 39.1.4.1 Validation Setting

The purpose of the Validation setting is to allow an import file to be checked for basic validation issues without the need to run the complete import process. This gives an early indication of any simple issues with the file structure or format by running the Columns Check and Validation steps of the Import Process (detailed below). Validate Imports are not queued, so once completed a result file is returned directly to the user, within the browser, showing where any validation issues occurred. This process does not check validity against any existing data and is designed as a quick ‘first check’ of an import.

#### 39.1.4.2 Simulation Setting

Imports run with the Simulation setting carry out all the steps of a full import but the data is not committed to the database. This allows an import to be fully checked for the potential changes it will make before being committed. Simulated Imports are queued, and once completed an email will be sent to the user with an Import Summary and links to the simulated import results. If the user is signed in at the time, they will also receive an on-screen notification.

#### 39.1.4.3 Full Setting

When an Import is run with the Full setting, all steps of the import are run and all changes are saved to the database. Full Imports are queued, so once completed an email will be sent to the user with an Import Summary and links to the full import results. If the user is signed in at the time, they will also receive an on-screen notification.

### 39.1.5 Import Process

The Import Process is broken down into several stages:



- Enqueue Import
- Column Check
- Validation
- Check Reference Values
- Get Current Record
- Check Business Rules
- Create Import Results/Email/On-screen notification

### **39.1.6 Enqueue Import**

To improve the usability and performance of the Import functionality within hub2, when a file is uploaded for import it is added to a queue before being processed by the software. Once the import has been added to the queue a notification will appear on-screen informing the user that the import file has been placed in the queue. The user is then able to navigate away from the import screen and continue to use the software without affecting the import process, instead of needing to wait for each file to complete.

Once the queued import has been processed the user will receive an email with an import summary, which will contain links to view and download the appropriate import result file. If the user is signed in at the time, they will also receive an on-screen notification.

If the Import Setting is Validate then the import will not be placed in the queue but will instead be processed immediately on screen to show any errors in the import document structure.

### **39.1.7 Column Check**

The Column Check ensures that all columns in the Import Sheet are valid for the selected import. If this is not the case and an invalid column is found, a page explaining why the import was not processed will be displayed.

### **39.1.8 Validation**

The Validation stage checks each field to be imported against some basic rules. This includes whether the amount of text is within the allowed limits and whether dates, numbers or other types of specialised fields are in the correct format.

Further details of each check are as follows:

#### **39.1.8.1 String Check**

Text fields within hub2 all have a maximum allowed length to prevent the database becoming too large and to ensure information can be properly displayed on-screen or in reports. String fields within Import sheets will be checked to ensure the text is within those limits.

#### **39.1.8.2 Date Check**

Dates within Import sheets must be in the correct format. Multiple date formats are supported and are grouped into two categories: Common Formats and Culture-Specific Formats. The Account Settings of the current user determine the Date Format in use throughout hub2, and this setting applies when Culture Specific date formats are used in an Import sheet. Alternatively, Common Formats will work regardless of the Account Setting, removing the potential for ambiguity e.g. day and month position in UK and US dates.

Each of the examples below show the same date: October 2<sup>nd</sup>, 2017.



### 39.1.8.2.1 Common Formats

Allowed Format	Example
D MMM yyyy	2 Oct 2017
d-MMM-yy	2-Oct-17
D MMMM yyyy	2 October 2017
MMM d, yyyy	Oct 2, 2017
MMMM d, yyyy	October 2, 2017

Table 81. Table showing Common Date Formats for Imports

### 39.1.8.2.2 English UK

Allowed Format	Example
d/M/yy	2/10/17
d/M/yyyy	2/10/2017

Table 82. Table showing UK Date Formats for Imports

### 39.1.8.2.3 English US

Allowed Format	Example
M/d/yy	10/2/17
M/d/yyyy	10/2/2017

Table 83. Table showing US Date Formats for Imports

In addition, certain fields do not allow dates in the future so this will be checked during this stage.

### 39.1.8.3 Integer Check

If a column on the import sheet corresponds to an integer data field, then only a whole number will be accepted. Any letter, or special character will cause the row to fail.

### 39.1.8.4 Double Check

A double is a floating-point number and as such any number with a decimal point will be accepted. The allowed length of the number both before and after the decimal point will depend on the length of the double. For technical details of the range of accepted values of each numeric field, please consult the separate Entity Specification.

### 39.1.8.5 Boolean Check

Boolean fields must be either true or false (on or off).

When importing, the following words are accepted as true, regardless of case

- True
- Yes
- 1



When importing, the following words are accepted as false, regardless of case

- False
- No
- 0

#### 39.1.8.6 Concurrent Fields Check

Certain Entity types have related fields which must be completed together, for example when signing off an item such as Tag ITR, Punch List Item or Handover in hub2 there are two fields that need to be filled in together: the person and the date. If one of these fields are filled in and the other is not, then the item cannot be saved and this row will fail validation. The items which have these checks are listed in the items business rules, in their relevant section.

#### 39.1.8.7 Check for Duplicate Rows

An Import cannot import the same row twice within the same sheet, for example, two Activities with Name "120" cannot be imported on the same sheet. The second occurrence of an item in an import sheet will cause that row to fail and only the first row will be imported.

#### 39.1.9 Check Reference Values

Some values to be imported represent a link to another Entity. For example, a Sub System import contains the System field, which contains the Name of the parent System.

When a reference value such as this is imported, the Entity it is referring to will be checked to ensure a matching record exists.

To put this more simply, if Sub System "MySubSystem1" with parent System named "MySystemA" is being imported then, for the import of "MySubSystem1" to be successful, "MySystemA" must already exist.

If there is no System named "MySystemA" in the System reference table, then that import row will fail.

If the item has a multi-part Name that is derived from several other fields (such as Tag ITR Name) then all the name parts are referenced in separate columns, this will be explained in the detail for the individual import.

#### 39.1.10 Get Current Record

This stage of the Import process loads the current record from the database to allow it to be compared to the values in the Import sheet to determine if changes are required. The Unique Identifying Fields within the Import sheet are used to locate an existing record within the database, which can vary between different Entity types, but in most cases are "Name". If an existing item exists within the database, it will be updated by the Import, otherwise a new record will be created.

#### 39.1.11 Check Business Rules

Many types of Entity within hub2 have Business Rules which ensure that the data held within the software meets certain requirements. For example, Preservation must be signed off within a certain date window.

These Business rules are explained in the relevant sections of the functional spec and the Import process will check each row to ensure that it follows the rules, however Business Rules will only be checked if the row has not already failed validation earlier in the process. If the business rules for the record are not satisfied, it will not be imported and an appropriate message will be displayed.



### 39.1.12 Create Import Results/Email/On-screen Notification

Once an Import has completed, there are three possible ways in which the results may be shown, depending on the Import Type and User Settings.

#### Import Result Sheet

The Import Result Sheet is an Excel file which provides the number of records which were Added, Updated and Deleted. A detailed breakdown of those changes is also included, which contains information on which fields were modified and what those changes were. A Validation Import returns a Result Sheet via the browser, however since no changes are made to data only validation warnings are included.

#### Import Result Email

Since Simulated and Full Imports are processed in a queue, the results are returned via an Email notification which contains a table showing the counts of records Added, Updated and Deleted. The email also contains links to the Import Log and to download the Import Result Sheet.

#### On-Screen Notification

If the user is currently signed in to hub2, an On-Screen Notification will be displayed containing a table showing the counts of Added, Updated and Deleted records. A link will also be displayed which navigates to the Import Log.

The choice of Import notification type can be in the User Settings.

### 39.1.13 Import Result Sheets

The Import Result Sheet contains the results of the import, including counts of records changed, details on each of those changes and any failure reasons.

On the Import Result sheet, there will be a count on items processed by their result type. The possible results are:

Field	Description	Import Type
To Be Added	A new record would have been added but the Import was in Simulate mode	Simulate
To Be Updated	An existing record would have been updated but the Import was in Simulate mode	Simulate
To Be Deleted	An existing record would have been deleted but the Import was in Simulate mode	Simulate
Added	A New Record has been added	Full
Updated	An existing record has been updated	Full
Deleted	An existing record has been deleted	Full
Unchanged	A record was imported but was the same as the existing item in the database	Simulate, Full
Valid	The record is valid based on the checks in Validation Mode	Validate



Field	Description	Import Type
Invalid	The record failed since an issue with the data was found	Validate, Simulate, Full

Table 84. **Table showing the available columns based on Import Type**

In addition to the counts of modified records, the Result Sheet contains a breakdown of the imported records within one or more worksheets, depending on the status of the records in the Import. For example, a sheet will contain all record results, with separate worksheets for records Added, Updated or Deleted.

These Import sheets are logged in the Import Log section if the Import was run in Simulation or Full modes and can be accessed at any time through that page.

#### 39.1.13.1.1 XLSX Results

The XLSX Import Result files will use the following colour scheme to fill the background of the cells to identify the different import results:

- Added: Bright Green
- Updated: Light Green
- Updated – Old Value: Orange
- Deleted: Orange
- Invalid: Bright Red

The order of the columns on each worksheet will match the order of the import. For example if the Import sheet places the Description column before the Name column, this will be reflected on the Result Sheets. If a column was not included in the Import then it will not be included in the Result Sheet, however the absence of the column may still cause a validation warning even though the column was not present on the Import.

When the Import Result Sheet is downloaded, it will be named with a default name based on the Entity name and Import Type for example: “Tag ITR – Validation.xlsx”

In the XLSX results there will be several different Worksheets detailing the Import results, these are:

#### Totals

The first sheet visible in the XLSX Results file shows the total counts for each possible import result outcome (Added, Updated, Deleted, Invalid, Unchanged, Not Processed) as well as a total rows count.

#### All Results

“All Results” contains all the rows which were in the Import file, in the same order as they appeared in the Import. There will be an Action Result column, which will state the import result for each row, this cell will be colour coded to match the result of the row. Each import cell will then be displayed, with appropriate cells also coloured based on any action which was applied to that cells value. The last column will be a details column which will display any information on why a row or cell value was classed as invalid.

#### Invalid

The “Invalid” sheet will display all import records which were invalid. Colouring any specific invalid cells. There will also be a Details column displaying the reasons for the data being invalid.



## **Added**

The “Added” sheet displays all import records which were added.

## **Updated**

The “Updated” sheet displays all import records which were updated, colouring any cells which had their value updated.

## **To Be Added**

The “To Be Added” sheet displays all import records which would have been added if the Import was not set to Simulate.

## **To Be Updated**

The “To Be Updated” sheet displays all import records which would have been updated if the import was not set to Simulate. Fields which would have been modified are coloured to indicate this.

## **Updated – Old Values**

The “Updated – Old Values” sheet displays all import records which were updated, however it will display the data which was present prior to the import being processed. Any cells which have had their value updated will display the old value, and will also be coloured appropriately.

## **To Be Updated – Old Values**

The “To Be Updated – Old Values” is the same as the “Updated – Old Values” sheet, except that it only appears for Simulated Imports, and shows the changes which would have taken place in a Full Import.

## **Deleted**

The “Deleted” sheet displays all the import records which were deleted, colouring the row of records deleted.

## **To Be Deleted**

The “To Be Deleted” sheet is the same as the “Deleted” sheet, except that it only appears for Simulated Imports, and shows the records which would have been deleted in a Full Import.

## **Unchanged**

The Unchanged sheet displays all the import records which were unchanged.

### **39.1.14 Import Result Email**

Import Result Emails inform the user that their import is complete, detailing the Import Table, Import Setting, Level, import number and the time the import was queued at. The email includes a table containing counts of items processed by their result type, which matches the corresponding counts shown on other Result formats such as XLSX file.

The Import Result Email will also contain the following links:

Text	Description
<a href="#">View Import Result Log</a>	Navigates to the Import Result Log View screen for the specific Import.



Download Import Result	Direct download link to the XLSX Import Result Sheet to access the import result details.
------------------------	---

Table 85. **Import Result Email Links**

### 39.1.15 Advanced Functionality

The Import feature has some additional functionality that can be used to overwrite the default behaviour of an Import Row or Column.

#### Action Column

The Action Column can be added to any import and provides additional control over whether data will be added, updated or deleted. When the column has a value, the behaviour of the Import of that Row is altered according to the Key Word:

Key Word	Effect
Add	The row can only be added. If the record already exists then this row will fail otherwise the Import will attempt to add it using the normal import rules.
Update	This row can only be updated. If the record doesn't already exist then this row will fail, otherwise the Import will attempt to update it using the normal import rules.
Delete	The record will be deleted. If the record doesn't exist, or if the record is in use elsewhere in the application (e.g. a Tag linked to a Tag ITR) the row will fail.

Table 86. **Details on the Key Words and Effects of the Action Column**

#### 39.1.15.1 Protected Column(s)

A column may be protected by adding a \* to the end of the header name for that column. A protected column cannot be updated via the import, this column will instead only be used when adding new records.

Field Name	Description*	Record
AX-001	Lorem ipsum	Update
AX-002	dolor sit amet	Add.

Table 87. **Example of Protected Columns within an Import**

For example, in the table above the first row is an update and the Description "Lorem ipsum" will be ignored by the Import (instead of overwriting the existing value), while the second row is an addition and so the description "dolor sit amet" will be used.

## 39.2 Pages

### 39.2.1 Import page

The Import page allow the uploading of a file to be imported. Before uploading a few items must be completed:

- Import Select – The correct Import table must be selected from a drop-down menu
- Import Setting – Validation, Simulation or Full Import
- File Upload – The File to be imported must be uploaded

Once these have all be selected the Import can be initiated by clicking the ‘Import’ button.

If the Import fails the Column Check stage, a separate page listing the invalid columns is shown. Similarly, if the user attempts to import a file in a format other than CSV or XLSX, the same page is displayed.

#### 39.2.1.1.1 Buttons

UI Element	Type	Description	User Restrictions	Feature Restrictions
Import	Button	Performs the Import with the selected settings	Import Permission for Selected Table	None
Download All Blank Templates	Button	Downloads all Excel Import Templates in XLSX Format	None	None
Download Blank Template	Button	Downloads the selected Import Table’s template without any data.  There is a select format option for this button that allows downloading in XLSX or CSV. The default is XLSX	None	None

Table 88. Details of the buttons on the Import page

### 39.2.2 Import Logs page

#### 39.2.2.1 Import Log Search page

The Import Logs search page allows the user to view the results of completed Imports. The page uses the standard search page layout with the ability to search by Created Date, or the type of Import performed. The Search Results show the log of completed Imports and allow the user to select an import to view more information on it.

#### 39.2.2.2 Listing of fields / clarification of details on page

##### 39.2.2.2.1 Search Results

The following search result fields are displayed:

Field	Path	Type	Sortable
Type	Type	Link to the Import Log View page	Yes
Added	Added	Number of records added by this Import	Yes
Updated	Updated	Number of records updated by this Import	Yes
Deleted	Deleted	Number of records deleted by this Import	Yes
Created Date	Created Date	Date the Import was performed	Yes
Import Setting	Import Setting	Validation/ Simulation or Full	Yes

Table 89. Import Log Search Result Fields

### 39.2.3 Import Logs View

The Import Log View page shows details of a completed Import including counts of the records added/updated/deleted, who performed the Import and when. It also allows the Import Results to be downloaded and reviewed.

#### 39.2.3.1 Listing of fields / clarification of details on page

UI Element	Type	Description	User Restrictions	Feature Restrictions
Download Result File	Button	Downloads the Result File in the XLSX Format	Read Permission	None
Search Import Results	Button	Returns the User to the Search page	Read Permission	None

Table 90. Details on the buttons on the Import Log View page

## 39.3 Validation & Business Rules

The Validation and Business Rules for each Import depends on the Entity being imported. As such the business rules for the Entity to be imported should be used for reference. For example, when importing a Tag ITR, the Business Rules for Tag ITRs will apply.



## 40 On Screen/Pre-set Reports

### 40.1 Definition

On Screen Reports are reports which are displayed only on screen. These reports are generally interactive and allow the user to drill down to get more information or interact in other ways to get more information.

### 40.2 Tag ITR Completions Grid

#### 40.2.1 Definition

The Completions Grid is designed to give a summary of the progress of all Systems and Sub Systems for the current Level E, with the ability to select a System or Sub System and find out more detailed information on its progress, including Handover Status, ITR Progress, Punch List Progress and MOC Progress. There is also the ability to get detailed information on the progress of the ITRs, Punch Lists and MOCs in grid format with hyperlinks available to directly link to any of these items.

#### 40.2.2 Layout

##### 40.2.2.1 System Grid

The front page of the Completions Grid is known as the System Page and it shows the ITR Progress of all Systems in the current Level E, along with the total progress of the Level E in the top left corner highlighted in yellow.

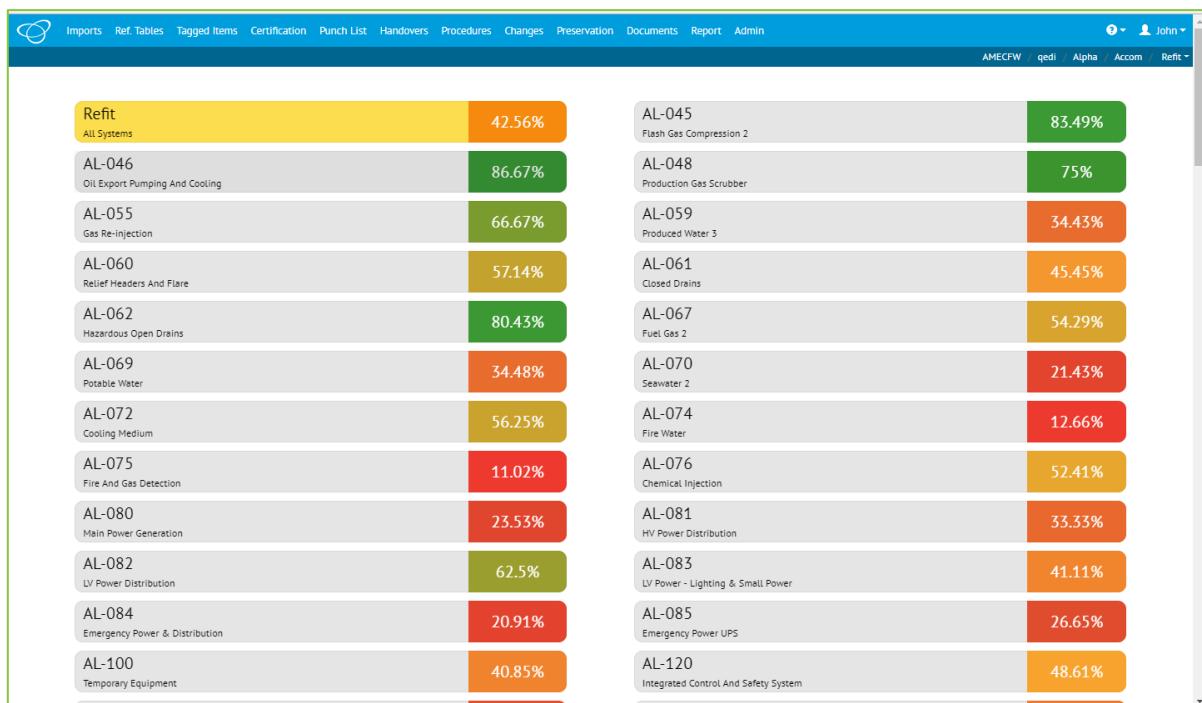


Figure 61. Screenshot of the Completions Grid on the System Page

The main body of the page is comprised of many boxes, one each per System or Sub System, depending on whether the user is currently viewing status at System or Sub System level. The User always begins at System level and clicking a box navigates into that System, to view the Sub Systems that comprise it. When

viewing the Sub System grid the selected System is displayed at the top of the grid with a yellow background.

Each box has the name of the item (e.g. the System or Sub System name) and that item's description displayed on the left-hand side. On the right-hand side there is a percentage complete value and a colouration which varies depending on the percentage complete value.



Figure 62. Example of item with 100% completion

The number and colour combination reflects the completeness of the certification work associated with the System or Sub System. A dark red box states that no ITRs have been completed for the System or Sub System, while a light green box shows that all ITRs have been completed. The colour changes gradually between the two as progress moves from 0% (none completed) to 100% (all completed). The percentage complete is shown below the System or Sub System number for each item to ensure that the progress is clear.



Figure 63. Examples of Progress Going from 0 to 100%

In addition to the Systems and Sub System, the first box displayed on the top left-hand side of the list displays the progress of the project. Clicking on this box brings up the details page instead of displaying the Sub Systems.

Systems and Sub Systems without any ITRs are still shown on the page but are coloured black and do not feature a percentage complete value.

#### 40.2.2.2 Details Page

The user can bring up a detailed view from the Sub System Grid by clicking on any of the items displayed including the System. This details page appears as a popup above the selected item from the completion grid making it easy for the user to navigate back and select another System or Sub System.

The detailed view gives further information on the System or Sub System. The top section of the tab shows the System or Sub System's Name and Description. The rest of the page is separated into multiple tabs, each displaying different information about the System or Sub System.

The percentages shown on the details page is only to one decimal place to match the other uses of the Graphical Charts like in the Home screen.

The Sub System Grid page has a back button on it that takes you back to the System Grid. This does not refresh the page however, which makes it quicker to navigate throughout the grid.

#### 40.2.2.2.1 Board Tab

The first tab shows a Kanban Board, described in more detail in the Kanban Boards section of this document.

#### 40.2.2.2.2 Overall Tab

The Overall tab is a visual representation of the Total counts of each entity, split into three sections each for ITRs, Punch List Items and MOCs. Each section contains a Totals chart to show the overall count and percentage complete for the entity. These are then split further into charts, one for each ITR Class, Punch List Item Category and MOC Type respectively. Charts are only shown if there is at least one Tag ITR for the chosen System or Sub System.

#### 40.2.2.2.3 Disciplines Tab

The Disciplines tab displays a bar chart for each Discipline that contains one or more Tag ITRs for the chosen System or Sub System. This shows a total count and how many Tag ITRs are complete for each Discipline.

#### 40.2.2.2.4 Handovers Tab

The Handover Tab shows details of the Handover progress for each Sub System. The Handovers shown are displayed in order based on the Handover Type order field, i.e. the order the Handovers are shown on the main menu. If the Handover matches the Level then the Handover status is shown with a view link to go directly to the Handover. If the Handover is at a lower level than the current item (i.e. Sub System Discipline on the Sub System page or Sub System Handovers on the System page), a progress bar is shown with the number complete, and a breakdown of each Handover with the status and view link are shown below.

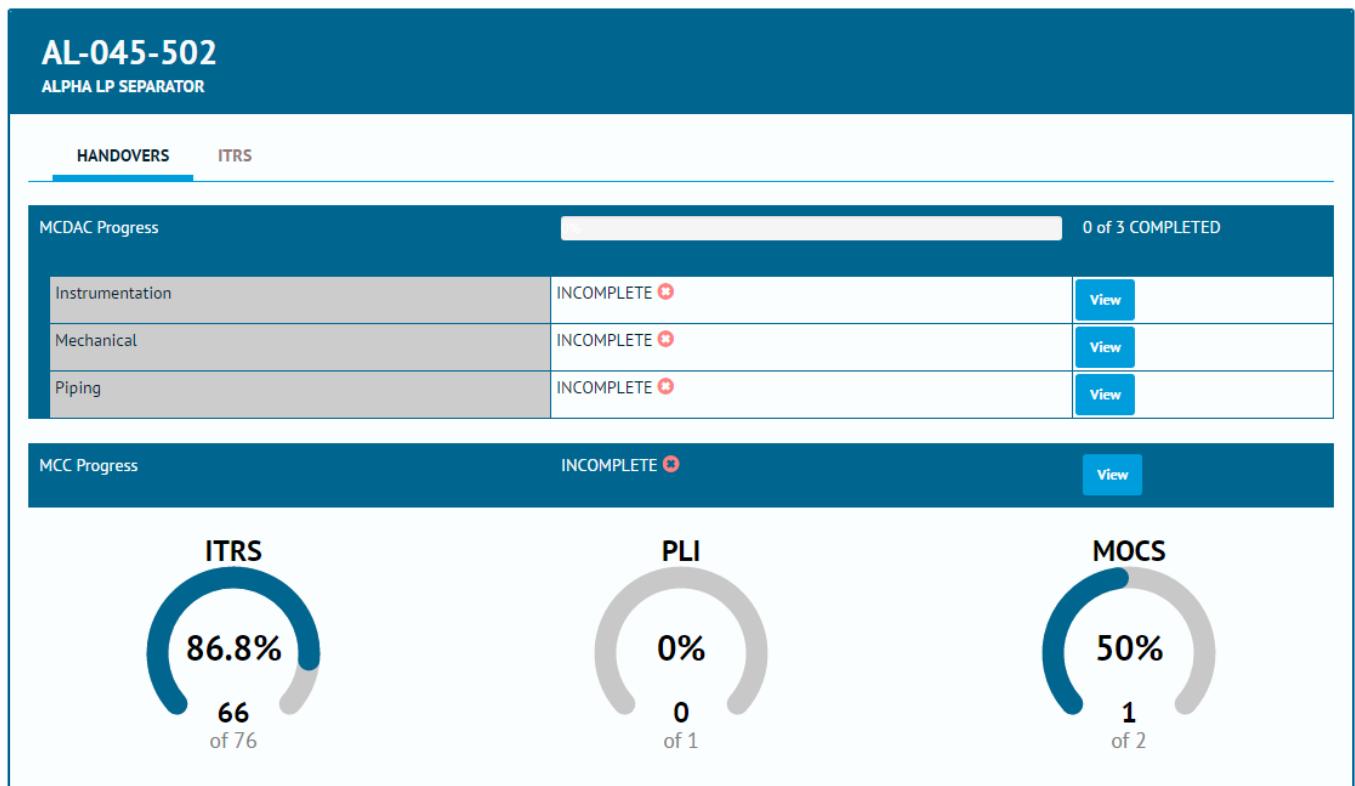


Figure 64. Example of the Completions Grid Handover Page

Level	Handovers Displayed
Level E	Level E
System	System, System-Discipline and Sub System
Sub System	Sub System, Sub System-Discipline

#### 40.2.2.2.5 ITRs Tab

There is a tab for ITRs which shows breakdown information relating to the selected System or Sub System. The tab shows a graph displaying the progress by ITR Class along the top with a paged grid showing the Tag ITRs associated with the selected System or Sub System. Clicking on the ITR Class along the top filters the grid by the chosen class. Charts are only shown for ITR Classes that have one or more Tag ITRs for the chosen System or Sub System.

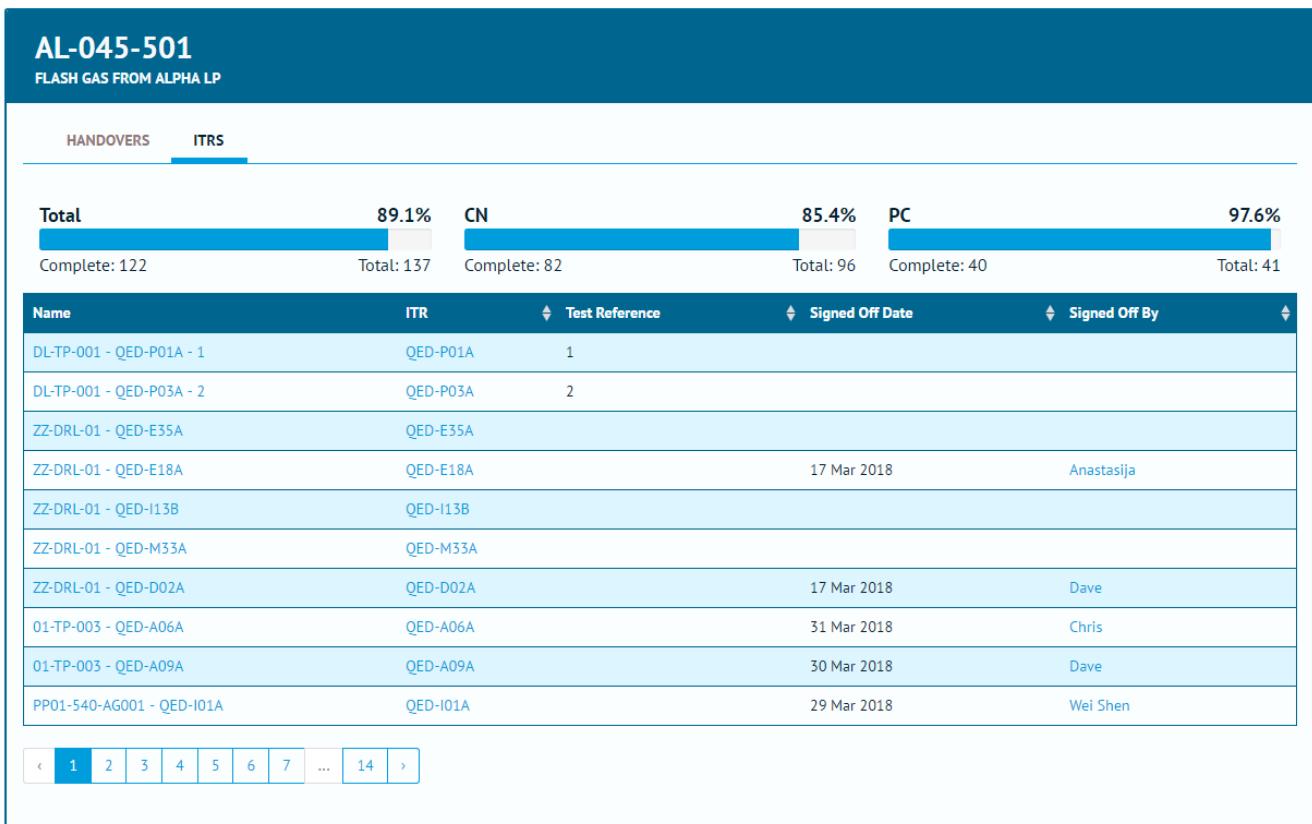


Figure 65. Example of the Completions Grid Tag ITR Page

#### 40.2.2.2.6 Punch List Items Tab

There is a tab for Punch List Items which shows breakdown information relating to the selected System or Sub System. The tab shows a graph displaying the progress by Punch List Category along the top with a paged grid showing the Punch Lists Items associated with the selected System or Sub System. Clicking on the categories along the top filters the grid by the chosen category. Charts are only shown for categories that have one or more Punch List Items for the chosen System or Sub System.

#### 40.2.2.2.7 MOCs Tab

There is a tab for MOCs which shows breakdown information relating to the selected System or Sub System. The tab shows a graph displaying the progress by MOC Type along the top with a paged grid showing the MOC associated with the selected System or Sub System. Clicking on the MOC Type along the top filters the grid by the chosen type. Charts are only shown for MOC Types that have one or more MOCs for the chosen System or Sub System.

#### 40.2.2.3 Details Page Download

On each of the Details pages, Level E / System / Sub System, there is a Download button which the user can click to download a PDF report of all the tabs in the respective Details page (currently excluding the Discipline tab). This includes the graphical reports and grids and the data downloaded is the same as seen in the UI. The information in the progress charts is rendered as tables.

### 40.3 Work Pack Completions Grid

#### 40.3.1 Definition

The Work Pack Completions Grid is designed to give a summary of the progress of all Work Packs and Job Cards for the current Level E, with the ability to select a Job Card and find out more detailed information on it including Operations, Tag ITRs, Drawings, MOCs and As Built Drawings. There is also the ability to get detailed information on the Operations, Tag ITRs, Drawings and MOCs in grid format with hyperlinks available to directly link to any of these items.

#### 40.3.2 Layout

##### 40.3.2.1 Work Pack Grid

The front page of the Work Pack Completions Grid is known as the Work Pack page and it shows the progress of all Work Packs in the current Level E. The progress of each Work Pack is calculated as the average Percentage Complete of all the Job Cards under each Work Pack.

AL01-00003 Scaffold Erect/Dismantle Scope	11.25 %	333-sk1 Install Computer System	90.00 %
333-sk-c1 Install Computer System	0.00 %	333-sk-c2 Install Computer System	0.00 %
A - AL-120-508 Auto-created from Certification	0.00 %	A - AL-122-506 Auto-created from Certification	0.00 %
U - AL-045-501 Auto-created from Certification	0.00 %	U - AL-120-510 Auto-created from Certification	0.00 %
U - AL-120-530 Auto-created from Certification	0.00 %		

Figure 66. Screenshot of the Work Pack Completion Grid on the Work Pack page

This report is very similar to the Completions Grid. The main body of the page is comprised of many boxes, one each per Work Pack or Job Card, depending on whether the user is currently viewing status at Work Pack or Job Card level. The user will always begin at Work Pack level and clicking a box will then navigate the user into that Work Pack, to view the Job Cards that comprise it. When viewing the Job Card grid the selected Work Pack will be displayed at the top of the grid with a yellow background.



Each box will have the name of the item (e.g. the Work Pack or Job Card name) and the item's description displayed on the left hand side. On the right hand side there is a percentage complete value and a colouration which varies depending on the percentage complete value.



Figure 67. Example of item with 35.25% completion

The number and colour combination reflects the completeness of the Work Pack or Job Card item. The colour coding is done the same way as the Tag ITR Completions Grid. Refer to section [40.2.2.1](#).

Job Cards without any percentage value will default to 0%.

#### 40.3.2.2 Details Page

The user can bring up a detailed view for a Job Card item. This can be done from the Job Card grid by clicking on any of the items displayed. This details page will appear as a popup above the selected item from the completion grid making it easy for the user to navigate back and select another Job Card.

The detailed view gives further information on the Job Card. The top section of the tab will show the Job Card Name and Description. The rest of the page is separated into multiple tabs , each displaying different details about the Job Card.

The Job Card grid page has a back button on it that returns to the Work Pack grid. This will not refresh the page however, which makes it quicker to navigate throughout the grid.

##### 40.3.2.2.1 Details Tab

The first tab is the Details tab which is the default selection when the page is loaded. This tab shows details of the Job Card as seen in the Job Card view page.

## 333-SK

## Inner Door Installation

DETAILS	OPERATIONS	TAG ITRS	MOCs	DRAWINGS
<b>Discipline</b> E				<b>Activity</b> BD0395
<b>Work Pack</b> AL01-00018				<b>Document Code</b> FSMSRQ
<b>Percentage Complete</b> 0.00 %				<b>Sub System</b> AL-124-508
<b>Assigned To</b> Chris				<b>Assigned Date</b> 2019-01-07
<b>Start Date</b> 2019-01-10				<b>End Date</b> 2019-01-12
<b>Job Card Status</b> Complete				<b>Estimated Hours</b> 89
<b>Rejection Reason</b> test				
<b>Signed Off By</b> (None)				<b>Signed Off Date</b> (None)
<b>Accepted By</b> (None)				<b>Accepted Date</b> (None)
<b>Comments</b> test				

Figure 68. Example of the Work Pack Completions Grid Details Page

## 40.3.2.2.2 Operations Tab

The Operations tab shows the Operations associated with the selected Job Card.

## 40.3.2.2.3 Tag ITRs Tab

The Tag ITR tab shows the Tag ITRs associated with the selected Job Card.

## 40.3.2.2.4 Drawings Tab

The Drawings tab shows the Drawings associated with the selected Job Card.

## 40.3.2.2.5 MOC Tab

The MOC tab shows the MOCs associated with the selected Job Card.

## 40.3.2.2.6 As Built Drawings Tab

The As Built Drawings tab shows the As Built Drawings associated with the selected Job Card.

## 40.4 Skyline

## 40.4.1 Skyline - Handover

Handover Skyline Reports are designed to visualise the progress of Handovers with regards to the completion of work required versus the Planned Completion Date.

Within a Skyline Chart each planned item is given a square box containing information on the item's progress.

These boxes are stacked vertically for each Planned Completion Date, with the dates themselves extending along the horizontal axis.

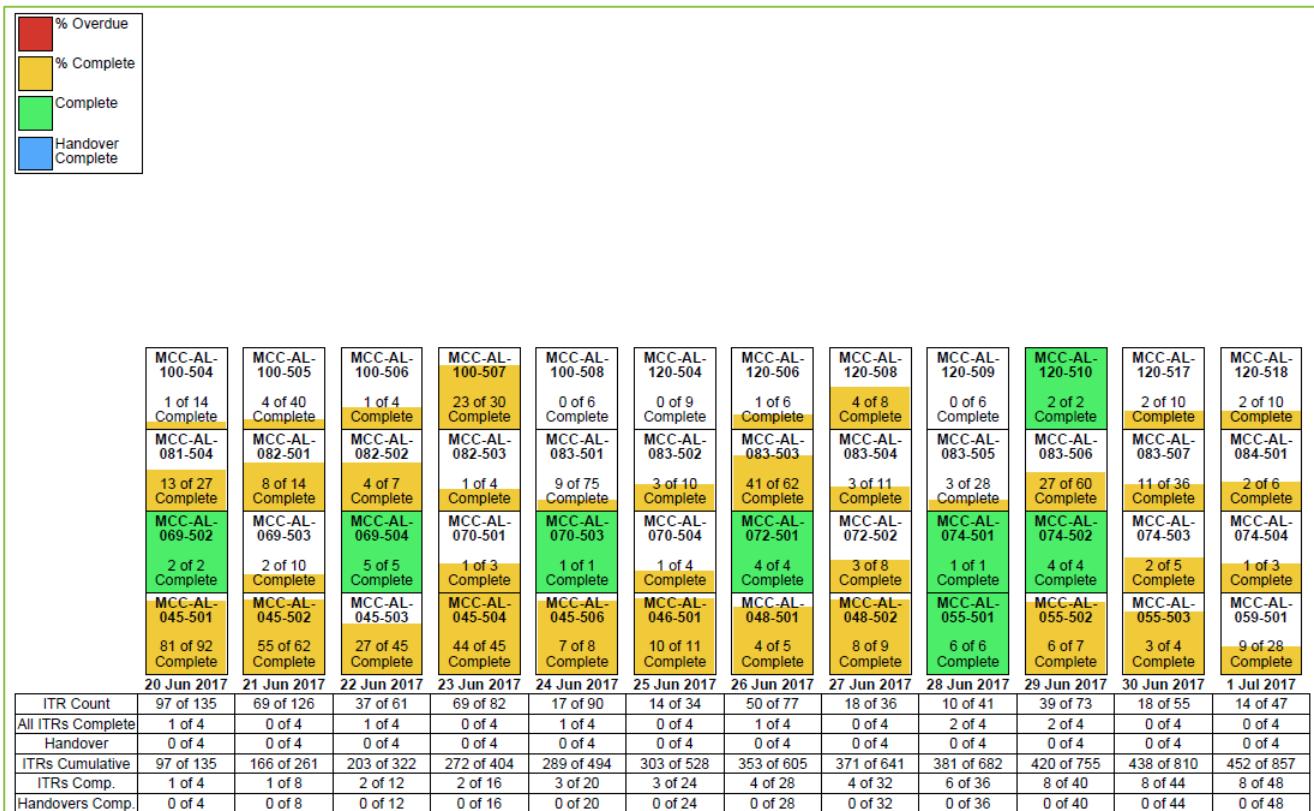


Figure 69. Example of a Skyline Report

As the information represented within the box progresses towards completion, the colour of the box changes to reflect this.

#### 40.4.1.1 Planned Dates

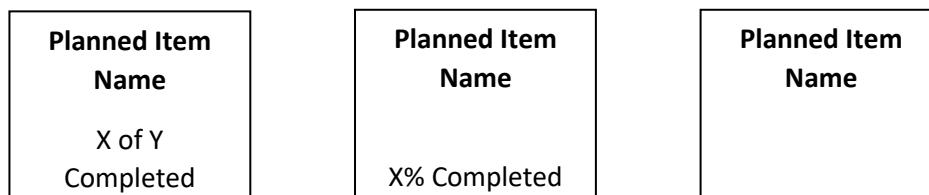
The Planned Completion Date values are shown on the horizontal axis. The Dates will only appear along the axis if there are one or more items planned for that day.

16 Nov	17 Nov	18 Nov	01 Dec	02 Dec
--------	--------	--------	--------	--------

In the above example, the values on the axis skip from the 18<sup>th</sup> November to the 1<sup>st</sup> December because there is no data for these dates.

#### 40.4.1.2 Detail Boxes

Each box contains the item's Name at the top in bold and then the number of items completed or the completion percentage along the bottom. Some Skyline Reports don't require status at all, and therefore status can be omitted completely if required.



The following examples detail the appearance of the boxes and explain the background colours as these vary depending on the situation and the progress of the item the box represents.

#### 40.4.1.2.1 Partial Completion

If 5 out of 10 items are completed (50%) then the box is half-filled with orange, with the orange filling from bottom to top:



Figure 70. Illustration of a Planned Item for which 50% of the work is complete

#### 40.4.1.2.2 Full Completion

Once the item is 100% complete the box is fully-filled, with the colour changed to green:

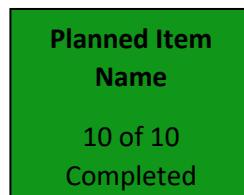


Figure 71. Illustration of a Planned Item for which 100% of the work is complete

#### 40.4.1.2.3 Overdue item with Partial Completion

Items which have planned dates in the past and are still not 100% complete are classed as overdue. Overdue items are shown in red, although if some progress has already been made the orange part of the Skyline is still shown in the normal fashion. For example, if an item should have been fully complete by the present date, but is only half complete, it would appear as below.



Figure 72. Illustration of an overdue Planned Item, for which 50% of the work is complete

#### 40.4.1.2.4 Items which have been Confirmed

Certain Skyline Reports include an additional status to indicate a further level of completion beyond having all constituent work completed. For example, an ITR Skyline box (representing some object to be handed over) will fill green as ITRs are signed off.

However, the Handover itself is not fully completed until it receives a Sign Off. When this occurs, the box will show as blue and be considered 'confirmed'.

It is important to note that this will happen even if the constituent parts of the Planned Item are not 100% complete as shown below.



Figure 73. Illustration of a signed off Planned Item, for which 90% of the work is complete

In the above example, the Planned Item has been confirmed (and therefore is showing blue) while only nine out of ten constituent items are complete.

#### 40.4.1.2.5 Planned Item Arrangement

If there are multiple items due on the same day, then they are stacked above each other until there is no further vertical space available. When this occurs, a new stack is created next to the current one and the process continues.

To distinguish between a new stack on the same date and a new stack on a different date, a space is visible between stacks as shown below.

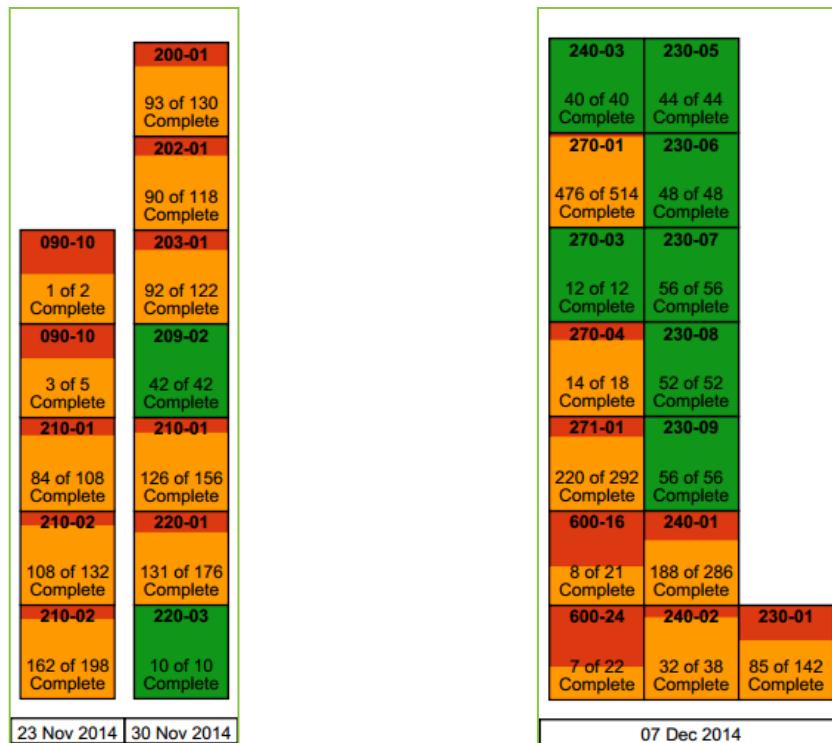


Figure 74. Figure showing the difference in Skyline Columns split by date and those that combine dates

#### 40.4.1.3 Details Popup

The Planned Items on the Skyline Chart allow the user to see further information on the item's progress by clicking on the Handover box. A popup will appear with the name of the Handover in the top left, and up to three tabs displaying grids that show the Tag ITRs, Punch List Items and MOCs associated with the Handover. Similar to other grids in hub2, there is a summary bar displaying relevant count information.

#### 40.4.1.4 Downloading to PDF

The Skyline Report can be downloaded to PDF. This will create a PDF version of the on-screen Skyline.

##### 40.4.1.4.1 Summary Table

Along the bottom of each PDF Skyline Report is a table that summarises the total figures for each date.

	20 Jun 2017	21 Jun 2017	22 Jun 2017
ITR Count	97 of 135	69 of 126	37 of 61
All ITRs Complete	1 of 4	0 of 4	1 of 4
Handover	0 of 4	0 of 4	0 of 4
ITRs Cumulative	97 of 135	166 of 261	203 of 322
ITRs Comp.	1 of 4	1 of 8	2 of 12
Handovers Comp.	0 of 4	0 of 8	0 of 12

Figure 75. Example of the Skyline Counts in PDF format

All the counts are given in the format (X of Y) with X being the number of items complete and Y being the total number of items to be completed.

Field Name	Details
[Item] Count	Count of all the items Completed and Due on this date. [Item] will normally be replaced by the name of the item being counted (e.g. "ITR Count").
All [Items] Complete	Count of Planned Items that have had all their items due on this date completed (i.e. the box is coloured completely green). [Items] will normally be replaced by the name of the item being counted (e.g. "All ITRs Complete").
[Confirmed]	Count of items that have been Confirmed for this date (i.e. shown with a completely blue background). The exact logic for this is configurable. [Confirmed] will normally be replaced by the name of the item to verify (e.g. Handover).
[Item] Cumulative	Running total of all the items Completed and Due up to this date. [Item] will normally be replaced by the name of the item being counted (e.g. ITRs Cumulative).
[Item] Comp. Cumulative	Running total of Planned Items that have had all their items due up to this date completed (i.e. shown with a green background.)

	[Item] will normally be replaced by the name of the item being counted (e.g. "ITRs Comp. Cumulative).
<b>[Confirmed] Comp. Cumulative</b>	Running total of items that have been Confirmed up to this date (i.e. box is shown with a completely blue background)  [Confirmed] will normally be replace by the name of the item to verify (e.g. Handovers Comp. Cumulative).

Table 91. Details on the Skyline Details table at the bottom of each Skyline Report

#### 40.4.2 Skyline – Tag Preservation Work List

In addition to Handover Skyline Reports, if the Preservation feature is enabled at Level C there is also an option to view Preservation Skyline Reports. This shows Preservation data in a similar way to the other Skylines with the following differences:

- Skyline Box will contain the Tag and PWL Names separated by a hyphen
- Horizontal Date fields for the Skyline will be the Due Date of the Tag PWL
- Boxes will be coloured orange if the Tag PWL has a % complete value
- Boxes will be coloured red if the Tag PWL is overdue
- Boxes will be coloured blue if the Tag PWL is signed off as Complete
- Boxes will be coloured green if the Tag PWL has a Digital Document and the Task Progress is at 100%
- When running the report, the End Date must be specified but the Start Date can be left blank
- The PDF download is a PDF copy of the same charts shown on the Preservation Skyline page

## 40.5 Kanban Boards

### 40.5.1 Definition

Kanban Boards show the progress of items, such as Tag ITRs. Items are represented by “cards” which progress across the board as work is completed.

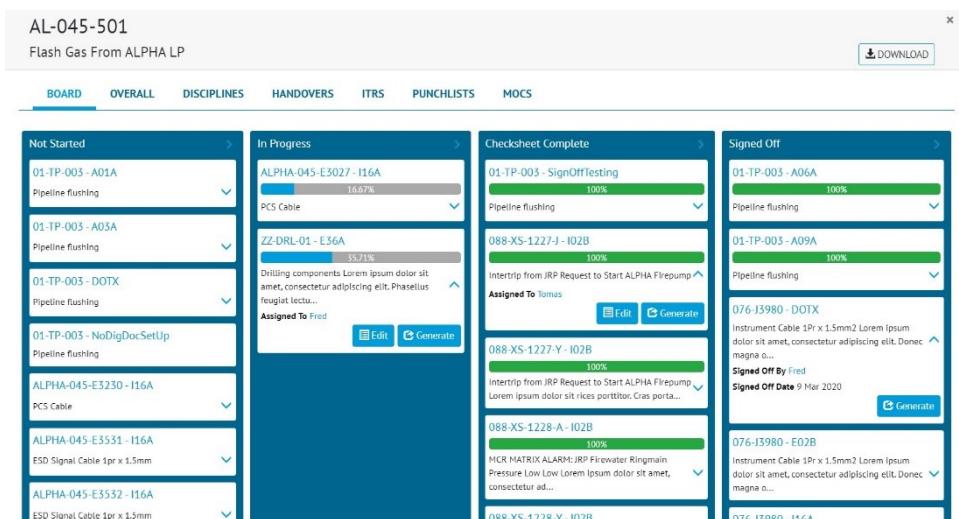


Figure 76. Screenshot of a Kanban Board in the Completions Grid

For example, the above screenshot shows the progress of the Tag ITRs within a single Sub System. Tag ITRs start at the left of the board, under “Not Started”. As document tasks and sign offs are completed, they progress through the columns across the board to the right.

Some key information is displayed on each card, such as who it is assigned to. This information will vary depending on the type of item and the stage it has reached. Buttons on the cards allow the associated documents to be edited or generated.

#### 40.5.2 Functionality

System and Sub System boards can be found:

- In the pop-ups in the Completions Grid
- In the pop-ups in the Handover Skyline
- Linked from the System and Sub System View pages

These boards show the progress of Tag ITRs within the System or Sub System. The Tag ITRs progress through the following stages:

- Not Started
  - No progress on the digital document and no sign offs have been made
- In Progress
  - One or more tasks on the digital document have been completed
- Check Sheet Complete
  - All required tasks on the digital document have been completed
- Signed Off
  - The Flexible Sign Off of Type “Complete” has been completed

Tag ITRs that use .DOTX generation rather than Digital Documents will appear under “Not Started” and then jump to “Signed Off”.

A Tag ITR card has the following information:

- The Tag ITR Name
  - This links to the Tag ITR View page
- The Tag Description
- A progress bar showing the percentage completion of the digital document, if one has been started
- The Authorised Person it has been assigned to, if there is one
- The Authorised Person and Date of the final sign off, if it has been signed off
- An Edit button:
  - This links to the Edit Digital Document page
- A Generate button:
  - This generates the digital document as a PDF
  - Or generates the .DOTX document

## 40.6 Kanban Boards

### 40.6.1 Definition

The Planned vs Actual Report is a chart that compares two metrics along a timeline. The report shows two lines on the chart each representing a metric. The default report group shown is Handover and the report type will depend on the Handover Type selected to be shown on the front page. Once the page is loaded a different report group and report type can be chosen by selecting the available options in the drop-down menu in the top of the page. Any of these reports can be downloaded to PDF, as detailed under section 8.2.6.1.

### 40.6.2 Handover Planned vs Actual

For each Handover Type selected, one line represents the calculated Planned line of when the Tag ITRs should have been signed off, and the second line represents the actual progress of the Tag ITRs.

The Tag ITR Planned vs Actual is a line chart that will show two lines:

- Planned – Calculated for each Handover Type by
  - a. Taking the number of days between the Handover Planned Start and Planned Finish dates and then evenly distributing the total Tag ITRs required (if the Start Date or the Finish Date is not populated, the Tag ITR will not be included)
  - b. Repeating for the next Handover Type (until there are no more remaining)
  - c. Aggregate the results
- Completed – The number of Tag ITRs completed on a given day

Handovers at Level E are not available for Planned vs Actual Charts.

### 40.6.3 Procedure Planned vs Actual

The following report metrics are available for comparison for Procedures:

- Planned Start Date vs Actual Start Date
- Planned Finish Date vs Approved for Issue Date
- Document Required By Date vs Approved For Issue Date
- Execution Actual Start Date vs Completed Date



## 41 Custom Reports

### 41.1 Definitions

The Custom Report allow users to create Detailed or Summary Reports that can be used throughout a Project. These reports are fully customisable and allow the key metrics of a Project to be reported on.

#### 41.1.1 Detailed Reports

Detailed Reports contain listings of information in a tabular format, with one row in the report representing one row of data stored in the application. These reports are often grouped into different sections to make it easier to digest the information.

#### 41.1.2 Summary Reports

Summary Reports are used to count key information in a certain grouping. This allows the Report to show; how many items are required for a certain task, how many of those items are completed, and how many are outstanding.

### 41.2 Report Layout

The layout of a Report depends upon whether they are created in PDF or Excel format. There follows an explanation of how viewing reports in these formats will influence the way the data is presented, and what the differences between them are.

#### 41.2.1 PDF

The PDF Report is split into three distinct sections: the header, the footer, and the content. The header and footer are the same for every report, while the content varies accordingly.

##### 41.2.1.1 The Header

The headers for all PDF Reports have the following layout:

Logo Left	[Report Name]	Logo Right
	[Level E Name]	

Table 92. **PDF Report Header Example.**

The logos produced will be based on the logos set in the Level D admin page. If one or both logos are missing, the Report Name and the Project Name will extend to fill the space.

##### 41.2.1.2 The Footer

The footers for all PDF Reports have the following layout:

Date: [Date] [Report URL]	Page: [X of Y]	Filters: [Filters]
------------------------------	----------------	--------------------

Table 93. **PDF Report Footer Example.**

'Page: [X of Y]' will show a total page count, while the date will show when the report ran.

'[Report URL]' will show the URL of the report, which the user can click to return to the report page.



Any filters selected prior to running the Report, are shown in the ‘Filters’ section of the Footer. The type and the value(s) used are shown with a colon between them, and each pair is separated by a comma, for example:

Sub System: 040-01, 040-02, Discipline: E, Location: Offshore

#### 41.2.1.3 Content

Content in the PDF Reports is displayed in tables. Each table will always take up the maximum width of the page, even if the full width is not required.

If too many columns are specified for a PDF Report, the information contained within each column may be unreadable. If this occurs, the reports should be modified using the customisation feature, explained later in this document, to reduce the number of columns.

PDF Tables can be grouped by specific fields. Grouping fields take up a whole row and appear just under a header. This allows content to be presented in the Report, without taking up an extra column. This is particularly useful for information which would otherwise remain the same over multiple rows, as shown in the example below:

No	Player	Team	Nationality	Position
1	Kenny Grace	Wimbledon Rovers	English	GK
3	Roxanna Gloor	Wimbledon Rovers	Scottish	DF
3	Ronda Spilman	Newmachar Utd	Scottish	DF
12	Tony Buggs	Wimbledon Rovers	Welsh	ST
16	Chadwick Queensberry	Wimbledon Rovers	Irish	MF
21	Rachel Gama	Newmachar Utd	Scottish	MF

Table 94. Example List of Data

This data could be grouped by Team and thus be presented as:

No	Player	Nationality	Position
<b>Wimbledon Rovers – 4<sup>th</sup> Place</b>			
1	Kenny Grace	English	GK
3	Roxanna Gloor	Scottish	DF
12	Tony Buggs	Welsh	ST
16	Chadwick Queensberry	Irish	MF
<b>Newmachar Utd – 5<sup>th</sup> Place</b>			
3	Ronda Spilman	Scottish	DF
21	Rachel Gama	Scottish	MF



This removes the need for the Team column, resulting in the same information being displayed but with additional horizontal space available – potentially for display of further information.

#### 41.2.2 Microsoft Open XML Excel Format (XLSX)

Excel Reports contains none of the header and footer information found in PDF Reports. Instead, only the content section is shown.

It should be noted that if an Excel Report spans multiple pages horizontally when displayed on screen, it would also require the same number of pages when printed.

Grouping is unavailable in Excel Reports, and therefore data which would be grouped in a PDF report is instead added as a column in an Excel Report. This can lead to data being repeated but ensures that all relevant information is available to the user. This also allows the use of in-built Excel filtering and sorting functions to provide further customisation, such as sorting by Team for example.

By default, the in-built filtering option will be activated but will not have any active filters. This functionality may or not be available, depending on the spreadsheet software used.

### 41.3 Report Pages

#### 41.3.1 View page

The Report List displays the Code and the Name of each Report in the following format:

- [Code] – [Report Name]

All Reports are grouped by the Category set in the Creating and Editing Custom Report page, except for ‘Pre-set’ and Skyline reports, which have their own categories respectively.

##### 41.3.1.1 Listing of fields / clarification of details on page

UI Element	Type	Description	User Restrictions	Feature Restrictions
<b>Report</b> – Multiple buttons showing Report Code and Name	Button	Clicking will take the User to the Report Filter page for chosen Report.	Read Permission	None
Edit Reports	Button	Directs the User to the Report Edit page	Edit Permission	None

Table 95. Details on the elements on the Report List page

#### 41.3.2 Filter page

The Filter page works like standard Search pages, with the ability to Filter data and then create that report. The Recent and Saved Searches functionality from standard Search pages is also available.

Further customisation of running PDF Reports can be achieved by clicking the arrow next to the “Run PDF” button and choosing “Select Report Options”. This will bring up a dialogue allowing the customisation of Page Orientation (Landscape or Portrait) and Page Size (A4, A3, A2, A1, A0 or Letter).

#### 41.3.2.1 Listing of fields / clarification of details on page

UI Element	Type	Description	User Restrictions	Feature Restrictions
Run PDF	Button	Filters all the items by the current search filters and then produces a PDF Report based on the selected Report	Read Permission	None
Run PDF – Select Report Options	Drop Down Button (Under Run PDF)	Runs PDF with customised Page Orientation and Size as selected in the Report Options Pop-up	Read Permission	None
Run Excel	Button	Filters all the items by the current search filters and then produces a PDF Report based on the selected Report	Read Permission	None
Clear	Button	Clears all filters.	None	None
Recent Searches	Drop Down	Last 5 Searches are available in this drop down. Selecting a search will fill in the search form.  The drop down will show the most recent search at the top, using the same format as the Quick Search Bar.	None	None
Saved Searches	Drop Down	Saved Searches are available in this drop down. Selecting a search will fill in the form.	None	None
Save Search	Button	Saves the search currently present in the search form.	None	None

Table 96.

Table 97. Details on the elements on the Report Filter page

#### 41.3.3 Edit page

The Edit page allows existing Reports (i.e. those added using the Report Creation Tool) to be customised, as well as changing the section (and order) in which they appear. They can also be deleted when no longer required. Pre-set Reports cannot be edited, deleted, moved, or re-ordered.

#### 41.3.3.1 Listing of fields / clarification of details on page

UI Element	Type	Description	User Restrictions	Feature Restrictions
Code	Button	Allows the code of the Report to be changed	None	None
Name	Button	Filters all the items by the current search filters and then produces a PDF Report based on the selected Report	None	None
Edit	Text Box	Loads the Report Creation page with details of this Report	Edit Permission	None
Delete	Text Box	Deletes the corresponding Report.	Delete Permission	None
	Drag and Drop Area	Clicking and dragging this section allows the Reports to be re-ordered. Saving will update the order on the Report List page	None	None
Add Group	Button	Shows a Text Box and two buttons ("Confirm" and "Cancel") that allow a new report Group to be added. If a name is entered and confirmed this will create a new area that reports can be dragged into. This section will appear in the report list page	None	None
Save	Button	Saves the changes made on the page.	Report Edit	None

Table 98. Details on the elements on the Report Edit page

## 41.4 Creating/Editing Reports

Two different types of Report may be created in hub2; 'Detailed' and 'Summary', with a slightly different process for each. Once a Report has been created it can be edited via the same process.

### 41.4.1 Detailed Report

#### 41.4.1.1 Select Type

The first step in creating a Detailed Report is to select the Type, as this will determine the filters and fields available. The Types that can be selected are:

- Assurance Tracker
- Cables

- Certification Grouping
- Job Card
- Lines
- Mech Joints
- MOC
- Procedure
- Punch List Item
- PWL Look Ahead
- Spools
- Subsystem
- System
- Tag ITR
- Tag PWL
- Tag Service Detail
- Tag
- Taggable Items
- Test Pack

#### 41.4.1.2 Select Groupings

Groupings divide the report into sections, ordered by the name of the item used in the Grouping.

The choice of Groupings available is dependent upon the Type selected (see Groupings tables below) and are only used on PDF reports (for Excel reports the Grouping is ignored).

Multiple Groupings can be selected. By default, this order matches the order in which the Groupings were selected, however this can be changed by dragging and dropping the Groupings in the Edit page.

Each Grouping is given a label that appears to the left of the Groupings Text and is automatically set to the same value as the Field Name. This can be changed by changing the value in the column “Label on Report”.

When selected, the Grouping Columns will automatically set the PDF Width to 0 for the column if selected from in the field section. The Excel Width will remain the same.

##### 41.4.1.2.1 Configure Separate Grouping Page (Optional)

There is an option to have a separate Grouping page. Selecting this option will alter how the report is generated.

Select Groups (PDF Only)

ITR	Tag Discipline
ITR Discipline	Job Card
Work Pack	System
Sub System	Primary Handover
Secondary Handover	Area
Module	hello
goodbye	Level E

	Group	Group Description	Label on Report
↔	System	System Description	System
↔	Sub System	Sub System Description	Sub System
↔	Job Card	Job Card Description	Job Card
↔	Work Pack	Work Pack Description	Work Pack

Separate Grouping Page

Figure 77. Separate Grouping Page Setting

With a separate Grouping page, the Grouping information will be displayed on its own page at the beginning of the Report, and the table containing the details for that Group will be on the following pages. Each variation in Grouping will take a new page. Grouping information will no longer be embedded at the top of each details table.

System: AL-045 - Flash Gas Compression 2	Sub System: AL-045-501 - Flash Gas From ALPHA LP
Job Card: (None)	Work Pack: (None)
<b>Reviewed And Issued By</b>	
Certification Engineer (Sign & Date): _____	Print Name: _____
<b>Reviewed And Approved By</b>	
Work Pack Originator (Sign & Date): _____	Print Name: _____
Construction Authority (Sign & Date): _____	Print Name: _____

Figure 78. Separate Grouping Page in a PDF Report

Additional static text can be configured to appear on Grouping pages, with the ability to configure a Title (bold and underlined text) and then rows of text. For each item in a row, there is an option to “Have Input Space” which will display an underlined area for information to be written on.

Configure Grouping Page (PDF Only)

Row: 1			<a href="#">X Remove Row</a>
Reviewed And Issued By			<a href="#">Remove Title</a>
Action	Text	HasInputSpace	
<a href="#">X Remove</a>	Certification Engineer (Sign & Date):	<input checked="" type="checkbox"/>	
<a href="#">X Remove</a>	Print Name:	<input checked="" type="checkbox"/>	

Row: 2			<a href="#">X Remove Row</a>
Reviewed And Approved By			<a href="#">Remove Title</a>
Action	Text	HasInputSpace	
<a href="#">X Remove</a>	Work Pack Originator (Sign & Date):	<input checked="" type="checkbox"/>	
<a href="#">X Remove</a>	Print Name:	<input checked="" type="checkbox"/>	

Row: 3			<a href="#">X Remove Row</a>
<a href="#">+ Add Title</a>			
Action	Text	HasInputSpace	
<a href="#">X Remove</a>	Construction Authority (Sign & Date):	<input checked="" type="checkbox"/>	
<a href="#">X Remove</a>	Print Name:	<input checked="" type="checkbox"/>	

<a href="#">+ Add Row</a>
---------------------------

Figure 79. **Grouping Page Configuration settings**

When configuring a Report Grouping page, there is a limit of two text items per row. There is also a limit on the total number of rows available on the Grouping page. There can be no more than 20 rows of information, consisting of; Groups, Grouping Page Row Titles, and Grouping Page Rows.

#### 41.4.1.3 Select Columns

The columns available depends on the Type selected – and can be selected from the Select Columns section. Once selected, they will appear in the Select Details table, where column settings can be changed. A full list of fields can be found in the Available Field section below.

Setting	Effect
<b>Header on Report</b>	Sets the Text of the Header that will appear at the top of every page on a PDF Report, or in the header row of the Excel Report
<b>Title (Above Header)</b>	Sets the Text of the Title Row that will appear at the top of the header row in both PDF and Excel Report formats. If two columns next to each other have the same title, the columns will be merged. This will allow the title to span multiple columns - for 3 columns showing ITR Counts, for example

<b>PDF Width</b>	Sets the PDF Width on the column. A PDF Report will always use the full width of the available page, and each column will be given a % of that width based on the Width setting  For example, if there are 4 columns each set to Width 10 then each will be a quarter of the Total Width. If an extra column with Width 20 is added, the existing columns will be given a sixth of the Total Width, and the new column will be given a third
<b>Excel Width</b>	Sets the Excel Width on the column

Table 99. **Table explaining the settings for Columns on the Detailed Custom Reports**

#### 41.4.1.3.1 Task Level Reporting Columns

On the Tag ITR Detailed Report, an additional column will be available to select. This column will give an overview of the Digital Document Tasks associated with each Tag ITR.

Field	Description
<b>Digital Document Task Progress</b>	The digital document task progress percentage of the Tag ITR

Table 100. **Additional Task Level Reporting column on the Tag ITR Detailed Report**

#### 41.4.1.4 Select Report Details

Before being saved, the Report Code, Name and Category must be set.

Field	Description
<b>Report Code</b>	Code on the Report displayed on the Report List page next to the Report Name
<b>Report Name</b>	Name of the Report, displayed on the Report List page and on the top of each PDF page
<b>Report Category</b>	Category used to Group Reports on the Report List page

### 41.4.2 Create Summary Report

#### 41.4.2.1 Select Type, Groupings and Breakdown

The first step for creating a Summary Report is to the select the Type, Grouping and Breakdowns. The Type must be selected first as this affects the available Groupings, and then the Grouping must be selected as it affects the available Breakdowns.

##### 41.4.2.1.1 Available Types

The following Types are available:

- Assurance Tracker
- Tag ITR
- MOC
- Procedure



- Punch List Item
- Handover

#### 41.4.2.1.2 Available Groupings

The following Groupings are available for most types:

- System
- Subsystem
- System Discipline
- Subsystem Discipline
- Primary Handover
- Secondary Handover
- Area
- Module

In addition, when the Tag ITR or Handover Type is selected, “Certification Grouping” is also available.

When Procedure is selected as the Type, the following Groupings are available:

- System
- Author System
- Procedure Type

When the Assurance Tracker Type is selected, Tracker Type is the only available Grouping.

#### 41.4.2.1.3 Available Breakdowns

Field	Available When
<b>Total</b>	For all Types except “Procedure”
<b>Handover Gate</b>	When “Tag ITR” is selected as Type
<b>ITR Class</b>	When “Tag ITR” is selected as Type
<b>Discipline</b>	When “Tag ITR” or “Punch List Item” is selected as Type, and Grouping is not “System Discipline”, “Subsystem Discipline” or “Certification Grouping”
<b>MOC Type</b>	When “MOC” is selected as Type
<b>Punch List Item Category</b>	When “Punch List Item Category” is selected as Type
<b>Total By Completed Date</b>	When “Procedure” is selected as Type
<b>Total By Approved For Issue Date</b>	When “Procedure” is selected as Type
<b>Procedure Document Status</b>	When “Procedure” is selected as Type

Table 101. **Table of Available Breakdowns for Custom Summary Reports depending on Type and Grouping Selected**



The Breakdowns show a Total, Complete, Outstanding, % Complete, % Outstanding and Graphical % Complete for each item in the Breakdown selected. For example, if the user chooses ITR Class, and there are 3 ITR Classes raised in this project, then the user sees three sets of columns from which they can select the items they want for each Breakdown.

When a Handover Report type is selected, three Breakdowns will show: ITRs, MOCs, and Punch List Items. Each of these Breakdowns will load their options as described in the Available Breakdown table. If a Certification Grouping is selected on a Handover report, the counts for Punch List Items and MOCs will be the Discipline and Sub System of the Certification Grouping compared to the Discipline and Sub System of the item.

The Graphical % Complete shows a blue bar that fills up as the % Complete increases. This continues until it fills the whole cell, and at this stage the bar will turn green to show 100% Complete.

When the Breakdown is Procedure Document Status, only a Total option is shown for each status for the total number of Procedures with that Procedure Document Status.

*Note: Punch List Items can have Tag ITRs which do have a Certification Grouping. These will not be used for the calculation of Punch List Items.*

#### 41.4.2.1.4 Task Level Reporting Columns on the Tag ITR Summary Report

On the Tag ITR Summary report, an additional four columns will be available to select. These columns will give an overview of the Digital Document Tasks associated with the Tag ITRs within the Grouping.

Field	Description
<b>Task Progress</b>	The digital document task progress percentage of the Tag ITRs within the current summary Grouping.
<b>Task Total</b>	The total number of Digital Document Tasks on the Tag ITRs within the current summary Grouping.
<b>Tasks Completed</b>	The total number of completed Digital Document Tasks on the Tag ITRs within the summary Grouping. For tasks that are Image, Table or No Comment (None with no comment selected) type, these will always be counted as complete as no progress can be recorded against them.
<b>Tasks Outstanding</b>	The total number of incomplete Digital Document Tasks on the Tag ITRs within the summary Grouping.

Table 102. Additional Task Level Reporting columns on the Tag ITR Summary Report

#### 41.4.2.2 Select Columns

The columns available depends on the Type selected. A full list of fields can be found in the “Available Fields” section below. These can be selected from the Select Columns section. Once selected, they will appear in the Select Details table, where the columns setting can be changed.

Setting	Effect



<b>Header on Report</b>	Sets the Text of the Header that will appear at the top of every page on the PDF or in the header row of the Excel Report
<b>Title (Above Header)</b>	Sets the Text of the Title Row that will appear at the top of the header row in both PDF and Excel Reports. If two columns next to each other have the same title the columns will be merged. This will allow the title to span multiple columns
<b>PDF Width</b>	<p>Sets the PDF Width on the column. A PDF Report will always use the full width of the available page, and each column will be given a % of that width based on the Width setting</p> <p>For example, if there are 4 columns each set to Width 10 then each will be a quarter of the Total Width. If an extra column with Width 20 is added, the existing columns will be given a sixth of the Total Width, and the new column will be given a third</p>
<b>Excel Width</b>	Sets the Excel Width on the column.

Table 103. Table explaining the settings for Columns on the Summary Custom Reports

#### 41.4.3 Additional Reporting Options

##### 41.4.3.1 PDF Groupings

Report Type	Report Grouping	PDF Grouping by
Handover, MOC, Punch List Item, Tag ITR	Sub System	System
Handover, MOC, Punch List Item, Tag ITR	System Discipline	System
Handover, MOC, Punch List Item, Tag ITR	Sub System Discipline	System and Sub System
Handover, MOC, Punch List Item, Tag ITR	Secondary Handover	Primary Handover
Handover, Tag ITR	Certification Grouping	System, Sub System and Discipline
Procedure	System	System Group
Procedure	Author System	Author

Table 104. Table of Groupings available for Summary Reports

When the PDF Grouping option is selected, if the Grouping by field has already been added as a field then the PDF width for that column will default to zero.

##### 41.4.3.2 Show rows with Zero values

System Discipline and Sub System Discipline summary reports have an additional option called 'Show rows with Zero values' which is disabled by default. When enabled, the report will list every combination of



System / Sub System and Discipline available. When disabled, the report will only show rows where the System / Sub System and Discipline combination have data raised against them.

## 41.5 Pre-set Reports

### 41.5.1 Skyline Handover Reports

The Pre-Set Skyline Reports are based around the various Handovers available in the currently selected Level E. There will be one Skyline report available per raised Handover Type, except for Handover Types where the Grouping has been set to Level E.

These Reports will all be in the Skyline format, with each box representing a different Handover. Each Skyline Box will count the number of ITRs associated with that Handover. Only items which have a Planned Finish Date appear on a Skyline Report any Handover without a Planned Finish Date will be excluded from the report. The Planned Dates come directly from the Planned Finish Date for the Handover.

The Skyline Reports will have the same filters as the corresponding Handover i.e. if the Handover is an MC1, then the Skyline Filters will be the same filters as those found on the MC1 page.

## 41.6 Displaying Data

### 41.6.1 Dates

Dates will be shown in the user preferred format in both PDF and Excel Reports.

### 41.6.2 Tag Sub Systems

Taggable items can have more than one Sub System, which creates an issue of how to display these correctly in the Reports.

To show all Sub Systems associated with a Tag ITR or Punch List there will be a row per Sub System shown on the Report.

If the Report does not require Sub Systems, then only one row will be shown.

This same rule applies when a Tag can be associated the two Systems. In these instances, the item will be shown in the Report for each System. This is so Excel Reports can be filtered to show all the items for a given System or Sub System, and also so that PDF Reports can be Grouped by System and Sub System.

#### Example

If the following data is stored in the application, and the user generates different format reports, then the rows will be repeated based on the information filtered for

Tag	ITR	Sub Systems	System
Tag-001	ITR-001	S01-01	S01
Tag-002	ITR-001	S01-01, S01-02	S01
Tag-003	ITR-001	S01-01, S02-01	S01, S02

#### 41.6.2.1.1.1.1 Report with just Tag and ITR

Tag	ITR
Tag-001	ITR-001
Tag-002	ITR-001
Tag-003	ITR-001

Table 105. **Table showing Report with Tag and ITR**

The table above shows only one row for each Tag ITR, as no System or Sub System data was filtered for.

#### 41.6.2.1.1.1.2 Report with just Tag, ITR and Sub System

Tag	ITR	Sub Systems
Tag-001	ITR-001	S01-01
Tag-002	ITR-001	S01-01
Tag-002	ITR-001	S01-02
Tag-003	ITR-001	S01-01
Tag-003	ITR-001	S02-01

Table 106. **Table showing Report with Tag, ITR and Sub System**

The table above shows 5 rows, with Tag-002 and Tag-003 ITRs repeated for each Sub System.

#### 41.6.2.1.1.1.3 Report with just Tag, ITR and System

Tag	ITR	Systems
Tag-001	ITR-001	S01
Tag-002	ITR-001	S01
Tag-003	ITR-001	S01
Tag-003	ITR-001	S02

Table 107. **Table showing Report with Tag, ITR and System**

The table above shows 4 rows, with Tag-003 ITRs repeated for each System. Tag-002 is not repeated as, although it contains two Sub Systems, they are part of the same System.

## 42 Scheduled Reports

### 42.1 Definition

Reports in hub2 can be scheduled to run periodically as a background process, and users can be notified when the results of the Report are ready.

Users will be able to choose from any of the Static, Skyline or Custom Reports available within the system, and configure them to run on a schedule.

Scheduled Reports Set Up can be accessed from the Admin menu and is available to admin users based on Scheduled Report resource permissions.

#### 42.1.1 Scheduling options

Reports can be scheduled to run in any determined periodicity:

- Daily
- Weekly
- Monthly
- Yearly

They can also be scheduled to run on particular:

- Hour(s) of the day
- Day(s) of the week
- Day(s) of the Month
- Month(s) of the year

#### 42.1.2 Notification

Notifications of Report results are sent via email. A Scheduled Report is configured to have a list of user email addresses. Every time the Scheduled Reports are run, the results are emailed to the configured email distribution list.

##### 42.1.2.1 Report Result Email

The Report result email has the Scheduled Report name as its title, a view link that takes the user to the Scheduled Report view page in hub2, and a Download button link to download the result file. The Download button specifies the result file size, so the user is made aware before downloading.



## Scheduled Report Generated

MCC Report Report Results

[View Report Result](#)

[Download Report Result \(12 KB\)](#)

If you have any queries relating to your report, please do not hesitate to contact the [qed Software Support Team](#).

Thanks,  
qed Software Support Team

If you're having trouble with the buttons above, copy and paste the URLs below into your web browser.

<https://localhost:44381/ScheduledReportResult/View/47a181dd-16b4-48d7-a9d8-5ab0e9cf8ccf>

<https://localhost:44381/ScheduledReportResult/Download/47a181dd-16b4-48d7-a9d8-5ab0e9cf8ccf>

Figure 80. Scheduled Report Result Email

### 42.1.2.2 Report Error Email

When a Scheduled Report fails to run and generate the report document, an error notification is sent to all users in the Scheduled Report distribution list.

## Scheduled Report Error

MCC Report Daily Report has failed to run

Apologies, an error has occurred during the generation of the report:  
MCC Report Daily

If the issue persists you can contact the [qed Software Support Team](#) directly.

Thanks,  
qed Software Support Team

Figure 81. Scheduled Report Error Email

## 42.2 Scheduled Report Set Up Pages

### 42.2.1 Scheduled Report Search

The Scheduled Report Search screen allows a user to search on all Reports scheduled in the system. The table below illustrates the fields on which the results can be filtered.

Field	Paths
Name	<u>ScheduledReport: Name</u>
Report	<u>ScheduledReport: ReportName</u>
Report Filter	<u>ScheduledReport: ReportFilter</u>
Document Format	<u>ScheduledReport: DocumentFormat</u>

#### 42.2.1.1 Listing of fields / clarification of details on page

##### 42.2.1.1.1 Search Results

The Search Results will be customisable in the future; in the meantime, the following fields are available.

Field	Path	Type	Sortable
Name	Name	Link to the <u>Scheduled Report</u> View page.	Yes
Report	ReportName	Text	Yes
Report Filter	ReportFilter	Text	Yes
Document Format	DocumentFormat	Text	Yes

Table 108. Scheduled Report Search Result Fields

##### 42.2.1.1.2 Scheduled Report Search Buttons

UI Element	Type	Description	User Restrictions	Feature Restrictions
Delete	Button	Shows the Delete Dialogue asking to confirm deletion of the Scheduled Report	Delete Permission	Scheduled Reports currently being processed cannot be deleted

Table 109. Details of additional buttons on the Scheduled Report Search page

### 42.2.2 Scheduled Report - View

The View page for a Scheduled Report is as any standard View page, and displays all the fields in a read-only format.

In addition to the Scheduled Report configuration fields, the View page also displays any filters that are applied to the Report through the Edit Filter page.

UI Element	Type	Description	User Restrictions	Feature Restrictions



Edit	Button	Allows the current <u>Scheduled Report</u> to be edited	Edit Permission	None
Search Scheduled Reports	Button	Navigates to the <u>Scheduled Report</u> Search page	Read Permission	None
New Scheduled Report	Button	Redirects to the <u>Scheduled Report</u> Add page	Add Permission	None
History	Button	Navigates to the History page for this item	Read permissions	None
Edit Filters	Button	Navigates to the Edit Filter page for this item.	Edit permissions	None

#### 42.2.3 Scheduled Report - Add and Edit

The Add/Edit page for a Scheduled Report, displays all the fields in an editable format or a blank form for adding a new Scheduled Report.

The Add Edit page contains a dropdown for all Reports in the system. This allows the user to select the Report that needs to run on a schedule. The desired document format to generate the Report can be chosen. Currently all the Handover Reports can be generated only as PDF, and this restriction is put in the UI. The Add Edit page also contains a separate control for selecting the schedule. The schedule control lets a user choose any periodicity.

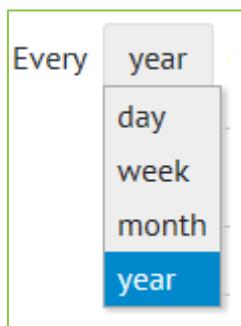


Figure 82. Schedule Control: select period

Based on this, the user can further select the exact month(s), day(s) and hour(s) upon which the Report should run.

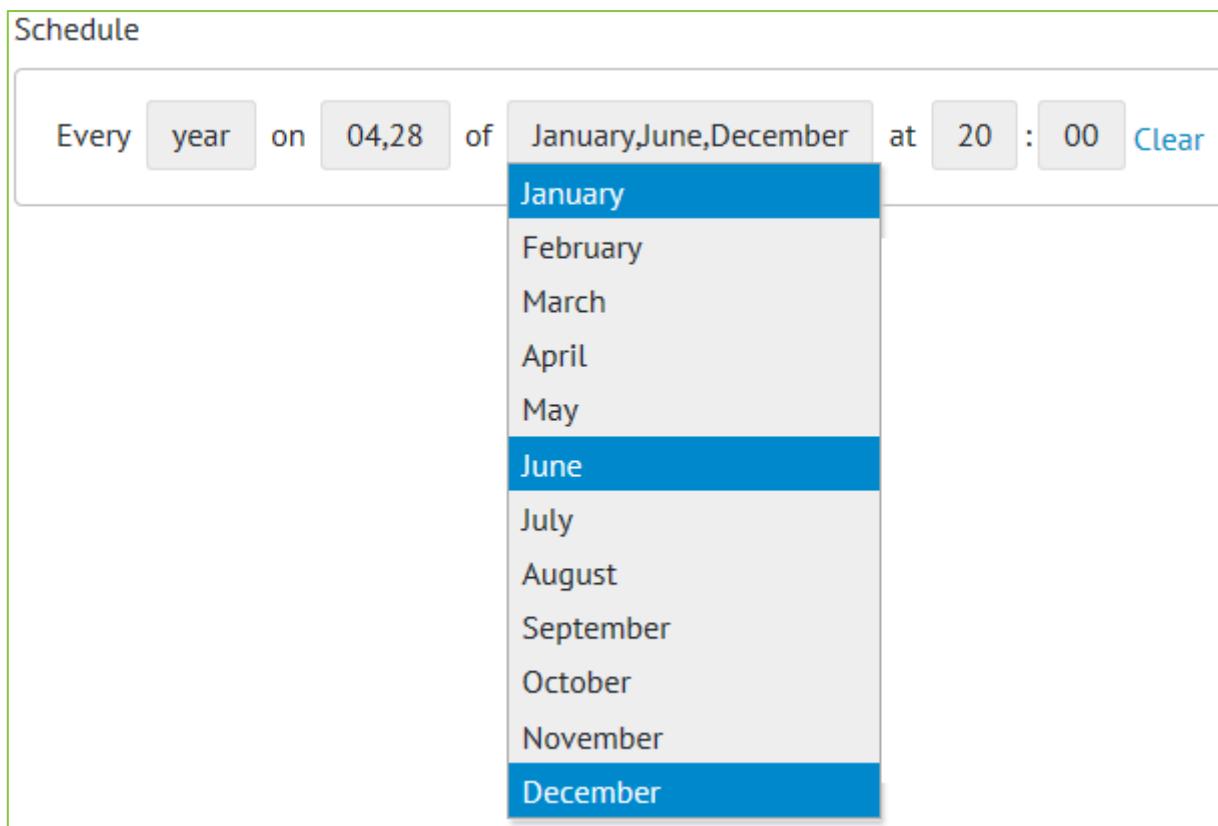


Figure 83. Schedule Control: Select months of a year when the report should run

The Clear button clears any selection, and resets the schedule to Every day at 00:00 hours. The user is restricted to set the Report to run every minute or multiple minutes in an hour. Any selected hour would be in UTC format. Finally, a user can configure a comma-separated list of email addresses. Report result notification is emailed to this distribution list. Email addresses are validated before saving the scheduled Report.

Once the Scheduled Report is saved, the user is not allowed to edit the Report field. If the user means to change the Report type, they are required to delete the existing Scheduled Report, and create a new one.

#### 42.2.3.1.1 Scheduled Report Add Edit Buttons

UI Element	Type	Description	User Restrictions	Feature Restrictions
Save	Button	Saves the changes made by the user	Adding or Editing Permissions	None
Save & View	Button	Saves the changes made by the user and navigates to the View page	Adding or Editing Permissions	None

Edit Filters	Button	Navigates to the Edit Filters Page	Adding or Editing Permissions	Available only for a saved Scheduled Report
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#### 42.2.4 Scheduled Report - Edit Scheduled Report Filters

The Edit Scheduled Report page allows the user to filter the Report results based on the chosen filter values. This page is very similar to the Search page where the search fields are loaded based on the report type. Saved Searches available for the report entity types are loaded in the Saved Searched List on the header. Users can create the Scheduled Report filters by choosing a Saved Search and/or entering values for each of the search fields manually. On saving, filter values are stored again the Scheduled Report and are applied every time the Report is generated.

UI Element	Type	Description	User Restrictions	Feature Restrictions
Save	Button	Saves the changes made by the user	Editing Permissions	None
Save & View	Button	Saves the changes made by the user and navigates to the Scheduled Report View page	Editing Permissions	None
Clear	Button	Clears all the filters on the page		

### 42.3 Scheduled Report Result Pages

#### 42.3.1 Scheduled Report Result Search

The Scheduled Report Search screen allows to search on all Scheduled Reports which have already been run in the system. The Scheduled Reports page can be accessed by any user having read access to the Report resource. The Scheduled Report Search page can be accessed from the Reports Menu.

The table below illustrates the fields on which the results can be filtered.

Field	Paths
Scheduled Report	<u>ScheduledReportResult-&gt;ScheduledReport: Name</u>
Scheduled Report Report	<u>ScheduledReportResult-&gt;ScheduledReport: ReportName</u>
Scheduled Report Report Filter	<u>ScheduledReportResult-&gt;ScheduledReport: ReportFilter</u>
Document Format	<u>ScheduledReportResult-&gt;ScheduledReport: DocumentFormat</u>

Table 110. Scheduled Report Result Search page filter fields

#### 42.3.1.1 Listing of fields / clarification of details on page

##### 42.3.1.1.1 Search Results

The Search Results, the following fields are available.

Field	Path	Type	Sortable
Name	<u>ScheduledReportResult-&gt;ScheduledReport :Name</u>	Link to the <u>Scheduled Report Result</u> View page.	Yes
Scheduled Report Report	<u>ScheduledReportResult-&gt;ScheduledReport: ReportName</u>	Text	Yes
Report Filter	<u>ScheduledReportResult-&gt;ScheduledReport: ReportFilter</u>	Text	Yes
Document Format	<u>DocumentFormat</u>	Text	Yes
Generated At	<u>ScheduledReportResult : Created Date</u>	Date	Yes

Table 111. Scheduled Report Result Search Result Fields

#### 42.3.2 Scheduled Report Result - View

The View page for Scheduled Report Result is the standard View page and displays the Scheduled Report Name, Report Name and Last Generated Date Time and Document format as read-only. The page has a Download button to download the latest Report that has been run.

##### 42.3.2.1.1 Scheduled Report Result View Buttons

UI Element	Type	Description	User Restrictions	Feature Restrictions
Download	Button	Downloads the generated Report document	Read Report permissions	

Table 112. Details of buttons on the Scheduled Report Result View page

## 43 Custom Fields

### 43.1 Definition

Custom Fields allow new additional fields to be added to hub2. They can be set up in certain pre-determined configurations to allow additional data to be input into hub2. This helps to better meet the requirements of a project, especially those with specific data requirements that might not be met by the standard field set. A maximum of 20 Custom Fields can be added to any single table.

The following tables can have Custom Fields set up for them

- All Tagged Items (Covers all Tag Types)
- Specific Tagged Items (Field for Tag, Test Pack etc. specifically)
- Procedures
- Punch List Items
- Job Cards
- Tag ITRs

The following types of fields can be set

- Boolean
- Date
- Reference Table
- String

The reference table field automatically creates a new reference table. This appears in the “Ref Table” section and works like any other reference table with the Name and Description fields.

### 43.2 Pages

#### 43.2.1 Custom Fields Settings

The settings page for Custom Fields allows the user to setup the Custom Fields. This includes selecting what table to use the Custom Field on and the type of field used.

##### 43.2.1.1 Index Page

The Index page shows a list of all the current Custom Fields setup for each table.

Name	Path	Type	Sortable
<b>Name</b>	<u>Name</u>	<u>String</u>	No
<b>Description</b>	<u>Description</u>	<u>String</u>	No
<b>Field Type</b>	<u>Field Type</u>	<u>String</u>	No

Table 113. List of the results for each Custom Field table

UI Element	Type	Description	User Restrictions	Feature Restrictions

Edit [Table Name]	Button	The Edit button appears at the top of each section and allows the user to go to the edit custom field page for that specific table	Adding or Editing Permissions	None
Reorder [Table Name]	Button	The Reorder button appears at the top of each section and allows the user to go to the reorder custom field page for that specific table	Editing Permissions	None

Table 114. List of the buttons available on the Custom Fields Index Page

### 43.2.2 Edit Page

The Edit page allows the Custom Field to edited or added to a Table. The edit page lists all the Custom Fields for the selected table.

UI Element	Type	Description	User Restrictions	Feature Restrictions
Save	Button	Saves the current table with the Custom Fields displayed	Adding or Editing Permissions	None
Save & View	Button	Saves the current table with the Custom Fields displayed and returns to the Index page	Adding or Editing Permissions	None
Add New Field	Button	Adds a new row to the page that allows a new custom field to be defined. This will not be added until saved	None	None

Table 115. List of the buttons available on the Custom Fields Edit Page

#### 43.2.2.1 Reorder Page

The Reorder page allows the order of existing Custom Fields to be changed i.e. Set which field will appear first in the Custom Field section and which field will appear last. The Custom Fields can be reordered by clicking on the reorder icon and dragging it up or down the table into a specific order. This new order can then be saved and displayed on View and Edit pages for the associated element.

### 43.2.3 Reference Tables

The Custom Reference Tables work like other reference tables with a similar Search, View and Edit screen. See Reference Table (Section 19) for more details.

### 43.2.4 Adding and Editing

The Custom Values are designed to work in the existing section in the same way as other fields. These fields appear on the selected table along with the normal fields on the View page and can be edited in the same manner as an existing field on the Edit page.



These fields also appear on the search pages for any Tagged Item, with the searches working the same way as with any other field.

#### 43.2.5 Exporting

Custom Values exports are available on any of the tables that implement Custom Values. Each of the Custom Values are given their own column at the end of the export, after the existing fields.

#### 43.2.6 Importing

Custom values can be imported in the same way as the normal fields. When a table with custom values is exported from the application it contains a column for each custom value. These can be edited and then the file can be uploaded via the Import section. Validation, Simulation and Full Imports work as normal and the custom values are updated when a Full Import is successfully completed.

#### 43.2.7 Data Change Logging

Changes to the values of any Custom Field are recorded in the Data Change Log just like any other field. For example, if we have a Custom Field “Zone” against a Tag “Tag-001” and we changed the value of Zone against that Tag from “Zone 1” to “Zone 2” the history log would show the change to this data, who changed it and when. See Data Change Logging (Section 38) for more details.

#### 43.2.8 Bookmarks and Digital Documents

Custom Fields can be selected as single value Bookmarks and from the Header section of Digital Documents.

Custom Fields are not available for selection as Table Bookmarks.

### 43.3 Validation & Business Rules

#### 43.3.1 Custom Field

Custom Fields which are in use (have populated Custom Values on the appropriate entity) cannot be deleted or have the Field Type changed.

Custom Fields which have the Feature Locked field set to true cannot have the Name or Field Type fields edited.

#### 43.3.2 Clean Energy

If a Level C is saved with the “Clean Energy” field set to true, then the list of pre-determined Custom Fields (See the Procedure Section 30) will be added if they don’t already exist. If Custom Fields with the same Name already exist they will have “Feature Locked” set to true. If a Level C is saved with the Clean Energy field set to false then the previously mentioned Custom Fields, if they exist, will have their Feature Locked field set to false.

## 44 Saved Searches

### 44.1 Definition

Saved Searches are searches that a user has saved for later use. They are stored on a per user per page basis.

### 44.2 Pages

#### 44.2.1 Search page for Saved Searches

##### 44.2.1.1 Overview of functionality / details of usage & workflow

#	Name	Entity	Created Date
1	Annabel	Punch list item	10 Sep 2018
2	AL-045-501 E	Tag JTR	10 Sep 2018
3	Equipment Type	Tag	10 Sep 2018
4	Tag Disc A	Tag	10 Sep 2018

Figure 84. Search page for Previously Saved Searches

This page allows the user to review all the current saved searches associated with their account and delete searches they no longer require.

##### 44.2.1.2 Button Listings

UI Element	Type	Description	User Restrictions	Feature Restrictions
Search	Button	Searches all the Saved Searches by the current search filters	None	None
Clear	Button	Clears all the search filters.	None	None
Delete	Button	Deletes currently selected items after a confirmation dialogue	None	None

**Table 116. Details on sections of the Saved Searches Search page**

#### 44.2.1.3 Delete Confirmation

Before deleting a saved search, the standard Delete Confirmation box is shown, allowing the user to cancel or proceed with the delete.

#### 44.2.2 Saved Search View page

##### 44.2.2.1 Overview of functionality / details of usage & workflow

This page allows the user to review all the filters contained in a Saved Search. The filters are listed alongside details about the Search page, Search Name and Date Added.

##### 44.2.2.2 Button Listings

UI Element	Type	Description	User Restrictions	Feature Restrictions
Edit	Button	Allows the Saved Search Name to be changed	None	None
Search Saved Searches	Button	Returns to the Saved Searches Search page	None	None

**Table 117. Details on sections of the Saved Searches View page**

## 45 User Settings

### 45.1 Definition

The User Settings page allows the user to set preferences for hub2, which apply to all the Levels the user has access to. These settings apply only to the current user, so any changes will not be observed by other users.

### 45.2 Pages

#### 45.2.1 User Settings

UI Element	Type	Description	User Restrictions	Feature Restrictions
Theme	List	Allows the user to change the colour scheme of hub2	None	None
Remember Last Level	Checkbox	Allows the user to skip the Level Select screen after logging in and go straight to the <u>Level E</u> they were last using	None	None
Notification Preferences	Lists	Allows the user to set how they would like to receive Notifications generated by hub2	None	None
Save	Button	Saves changes to the user settings	None	None

Table 118. List of the controls available on the User Settings Page

## 46 Logging

### 46.1 Definition

Logging is the process of sending messages about the state of an application to a log file or store. Logging is used by the GoTechnology Development and Support teams to identify current problems and implement changes to hub2 . In being able to see additional details on any user issues or performance problems, GoTechnology are better able to plan future modifications to improve the product over the course of its lifetime.

### 46.2 Usage

The logging in hub2 is mostly for recording error messages, with exceptions in the application being caught and sent to the Application Insights Activity Log, hosted in the Azure portal.

In addition, logging messages have been added to help GoTechnology when dealing with complex issues that might arise. These messages can be added to our standard logging when needed but are normally turned off as they are not required and have a minor performance impact.

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