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TATA

TATA CONSULTANCY SERVICES

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etisalat

Etisalat PM & PM Frequency Configurator Application, PM WO generation

Annexure Version 0.1

January 2021

Notice

Revision History

Date	Version	Description	Author	Company
12/31/20	1.0	Initial Creation	Maximo Implementation Team	TCS

Contents

List of Abbreviations

TCS	Tata Consultancy Services Ltd.
WO	Work Order
PR	Purchase Requisition
GL	General Ledger
PO	Purchase Order
IBM	International Business Machines
SME	Subject Matter Expert
RnR	Repair and Return Process

1 Introduction

Emirates Telecommunications Group Company PJSC ("ETISALAT") wants a comprehensive solution for the supply, installation, testing, commissioning and integration of Enterprise Asset Management Solution with the existing OSS/BSS, ERP systems and customizing the setup to satisfy Etisalat's requirements, in order to provide an end-to-end solution to manage and run maintenance and operations of Etisalat's Telco, Non Telco and Software Assets in accordance with the technical specifications and feature requirements.

To enable the right fit of functionality, capability and strategic roadmap for Etisalat' requirement, TCS is using IBM Maximo 7.6.1 with IBM Control Desk (ICD) and Tivoli Dependency Discovery Manager (TADDM) for Etisalat's desired asset management objectives.

2 Purpose of Document

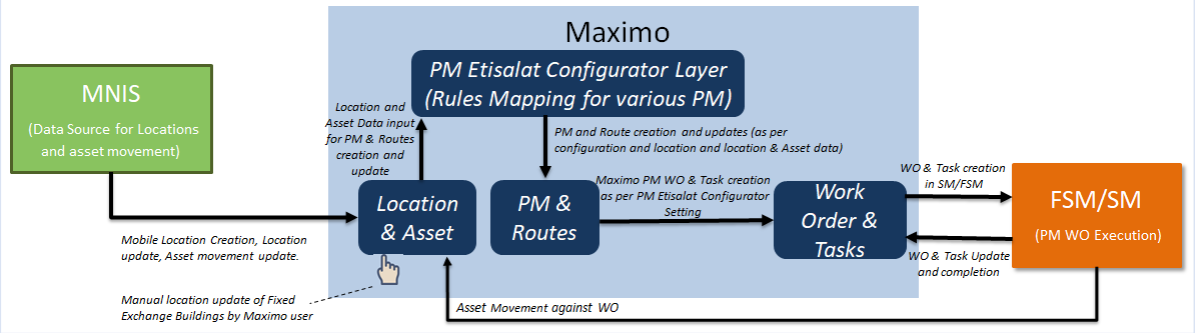
This document includes the details on the Requirement, Design, testing and training considerations for the Auto-Creation of PM and Routes and Frequency Calculation.

3 Scope & Business Requirements

Requirement Description	Source	BRS/RFP Requirement ID	Remarks
Automatic Creation of PMs. • New PMs for existing location should be created based on defined configuration rules. • New PM for new location should be created based on defined configuration rules.	CRP		
Automatic update of PMs when configuration is updated – update of configuration includes – • WO structure Change (One WO One Task, One WO Multiple Task) • Addition/deletion of associated Asset classification • Change of task type • Addition/deletion of parameters • Addition/deletion of parameters value(s) • Change in weightage percentages for a parameter • Change in weightage percentage for a value of a parameter. • Change in weightage range and frequency cycle per year.	CRP& Existing PM FDS		
Provision to create configuration and associated PMs for 4 types – • Telecom PM • Cooling PM • Power PM • Base Load Genset PM	Existing PM FDS & PM Configurator Functional Demo.		
For Mobile sites, the PM frequency parameter values in a location should be updated from MNIS system (via MNIS enrichment integration).	Hypercare Discussion & PM		

Requirement Description	Source	BRS/RFP Requirement ID	Remarks
There are 12 parameters agreed for update from MNIS – 1. Site Category (Service Level) 2. Site Type (Sector Coverage) 3. Site Location (Site Serving Category) 4. Hub Site 5. Structure Type 6. BTS Type 7. Accommodation 8. No. Of Radio Links 9. Rectifier Make Type 10. Generator Operating Mode 11. Battery Capacity 12. Backhaul Link	Configurator Functional Demo		
For Fixed Exchange sites, there would not be any automatic update of parameter value from external system in Maximo Location. User needs to update parameter value manually at 'EXCHANGE/BUILDING' location.	PM Configurator Functional Demo		
Automatic update of PM frequency for a single location when one or other value of PM frequency parameter is updated on the location.	CRP & PM Configurator Functional Demo		
Provision to create configuration and associated PM for a specific technology.	PM FDS		
A Specific set of users should be allowed to create and manage configuration.	PM Configurator Functional Demo		

4 Business Service Process Flow



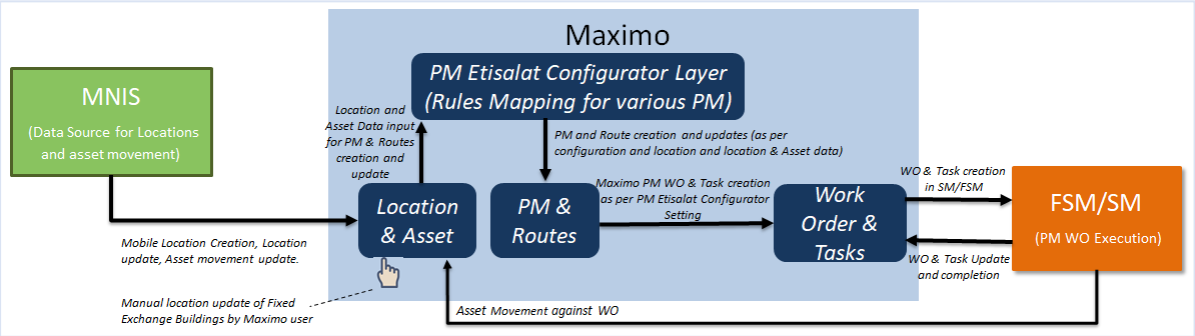
Business user shell create and configure a new PM configuration or update existing configuration in Configurator Application. The configuration are the rules that defined how PMs should exist in Etisalat Maximo and how WOs and tasks will be created. User can create and update a configuration based on following set of values:

Configuration	Possible Type/ values	Remark
PM Type	Possible PM Types available for selection: 1. Telecom PM 2. Cooling PM 3. Power PM 4. Baseload Genset PM	Required to select while creating new configuration. Cannot be modified or changed on an existing configuration.
Location type	Possible Location Types available for selection: 1. Mobile Access 2. Exchange/Building	Required to select while creating new configuration. Cannot be modified or changed on an existing configuration.
WO Structure	Possible values available for selection: 1. One WO per asset with Single Task 2. One WO per site with One Task per asset 3. One WO per site with standard single Task	Required to select while creating new configuration. Can be modified on an existing Configuration. Once modified, associated PMs will be updated accordingly and future PM WO and tasks will be structured according to selected value.
Section	Various Etisalat sections Example: FO&P\OFS	Required to select while creating new configuration. Cannot be modified or changed on an existing configuration.
Sub-section	Various sub-section of selected section. Example: Mobile, Access etc.	Required to select while creating new configuration. Cannot be modified or changed on an existing configuration.
Frequency Type	Possible PM Frequency Types available for selection: 1. Fixed 2. Dynamic	Required to select while creating new configuration. Can be modified or changed on an existing configuration.
Asset Technology	Various Asset technologies	Non-required while creating new configuration. Cannot be modified or changed on an existing configuration.

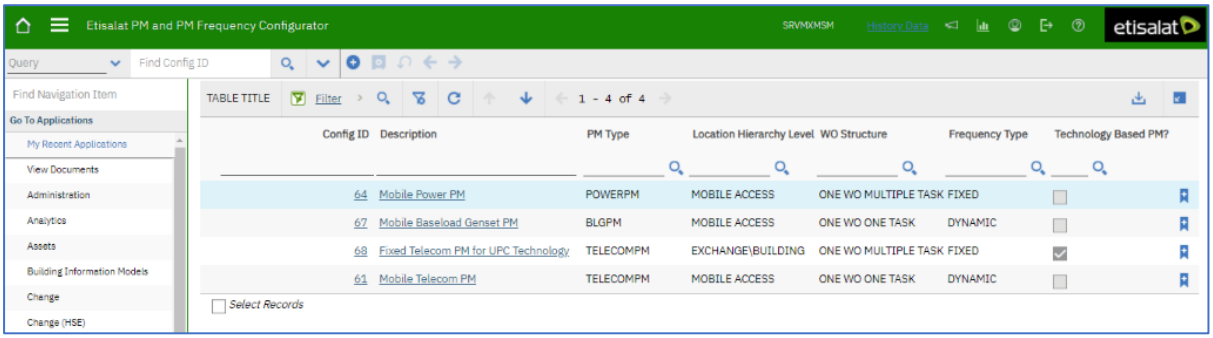
Classification	One or multiple Etisalat Asset classification Example: ETISALAT \ NONTELECOM \ POWER \ BATTERY BANK 1 \ BATTERY ETISALAT \ TELCO \ RACK	
Task Name	Various FOP task name	Required to select against a selected classification while creating new configuration. Can be modified or changed on an existing configuration. Once modified, associated PMs will be updated accordingly and future PM tasks will be set with task name according to selected value in configuration.

3. If user chooses Frequency Type to be “Fixed” then user needs to specify the frequency value.
4. In case of “Dynamic” frequency type, user can add any number of parameters from the list and associate weightage percentage to each of the parameter value. (Sum of all weightage percentage should equal 100)
5. Also, user has to add value(s) for each of the chosen parameter and associate weightage percentage to each selected value. (Sum of all weightage percentage should equal 100)
6. User has to add Frequency Range and specify the Frequency for each Range value.
7. Based on the defined rules, existing PM and Route records are updated accordingly through background job.
8. If there are no such existing PM or Route records based on new set of rules defined, then new PM and route records are automatically created through this Configurator Application via background job overnight.
9. If there exist an active PM for a location and if user updates the value of location parameter in Configurator application, then the existing PM record is also updated.
10. When any asset for which a Route record exists, moves from Operating Location to Storeroom, then the corresponding asset details are excluded from its associated Route record. Also, the future WO to be generated for that location will not contain any information about this asset.
11. When any asset moves from Storeroom to Operating Location, the system finds an appropriate Route record (as per defined configuration) for Asset’s location, Asset’s classification and asset’s technology matches and add itself in that route.
12. If there does not exist any such Route record, then a new Route record is created automatically through the Configurator application via background job.
13. When one of a location frequency parameter(s) are updated (via MNIS for Mobile sites or manually by user for fixed exchanges), the frequency for the associated PM are also updated as per PMs configuration. In case there is no PM exists for the location, the system creates associated PMs automatically as per defined configuration.

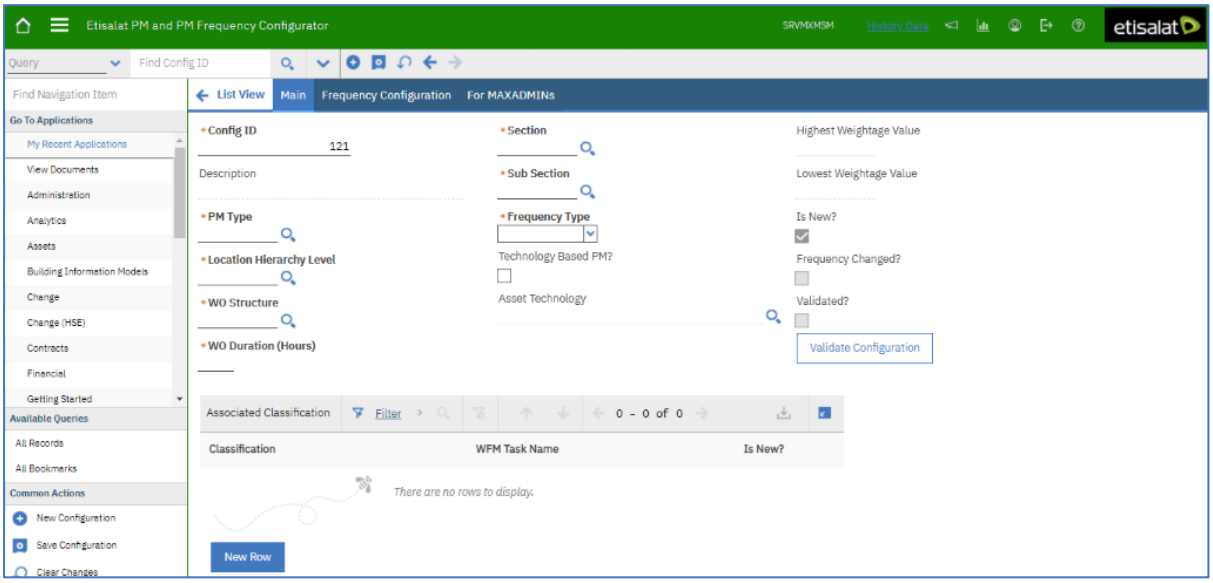
5 Design Specifications



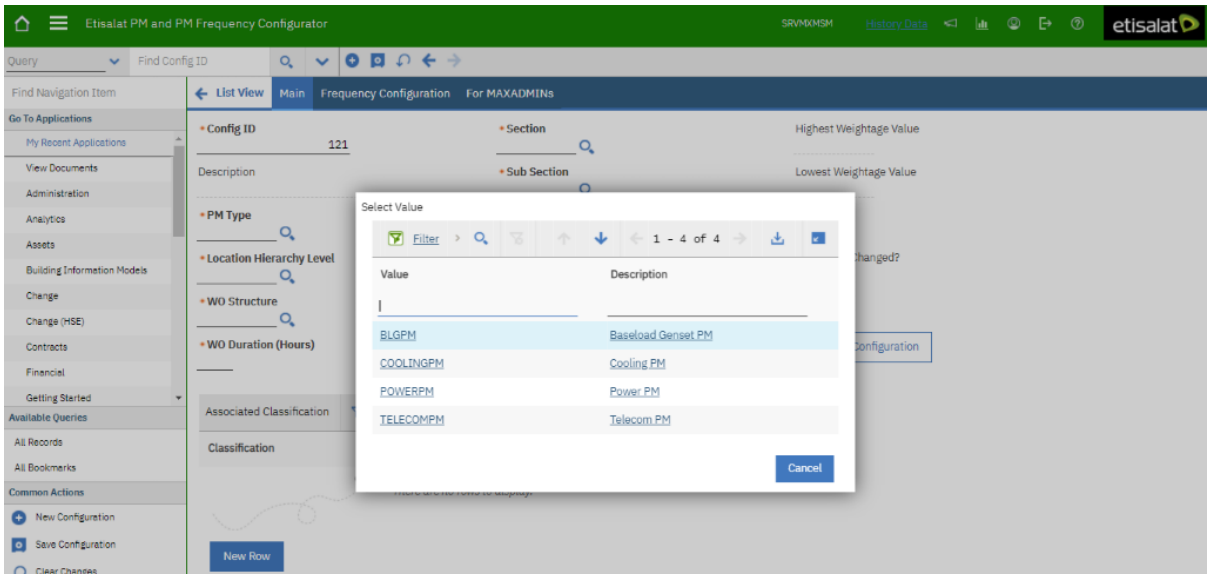
1. User can view the list of existing configuration records in List tab and can filter them on basis of various parameters.



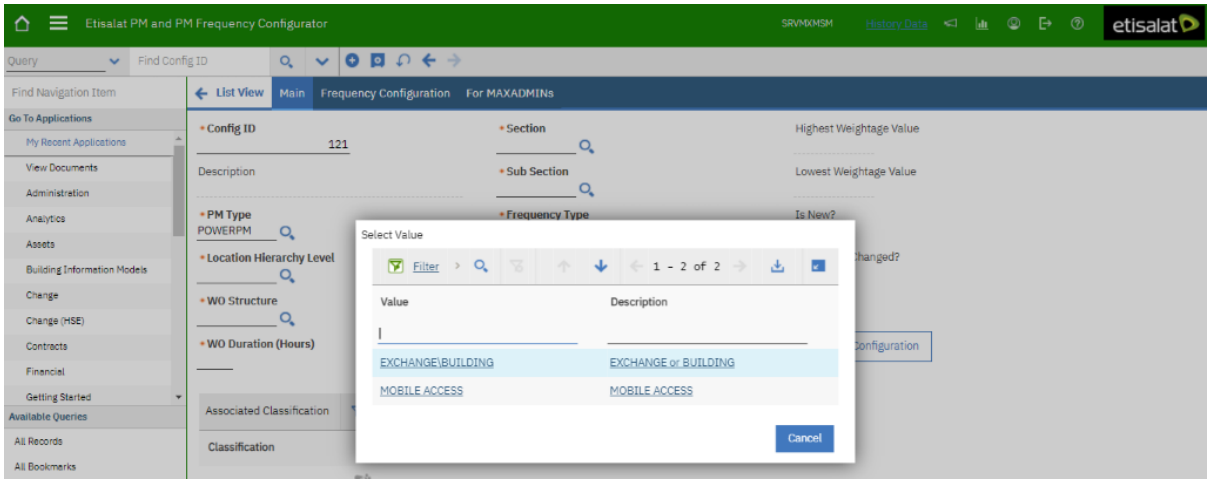
- User can create a new configuration by entering values in following fields:



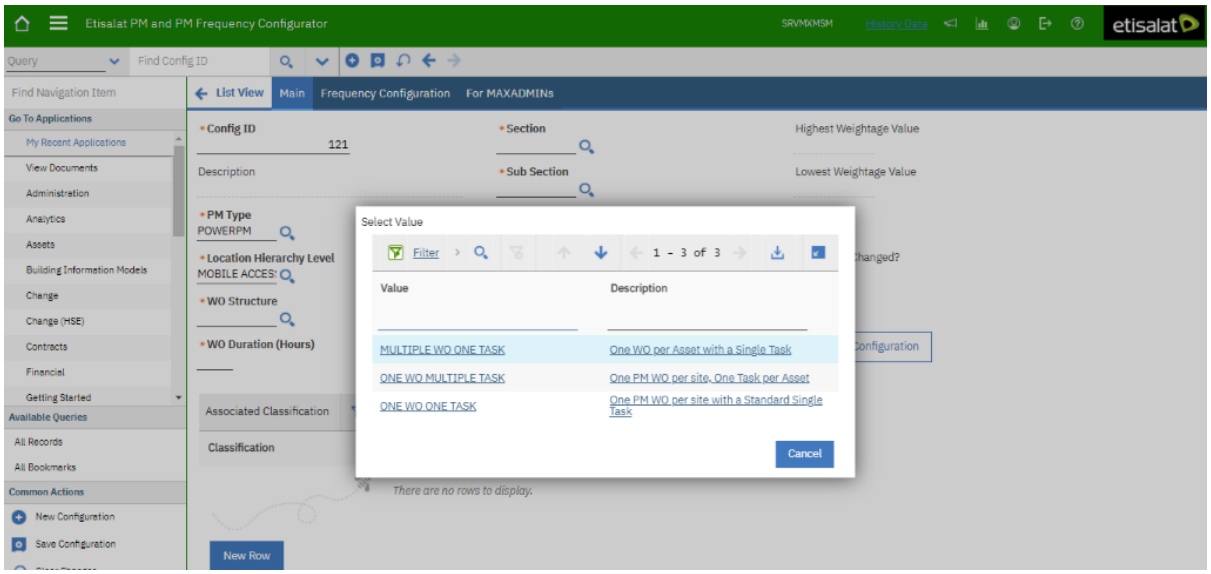
- PM Type: User can select PM type from available options (BLGPM, COOLINGPM, POWERPM, TELECOMPM).



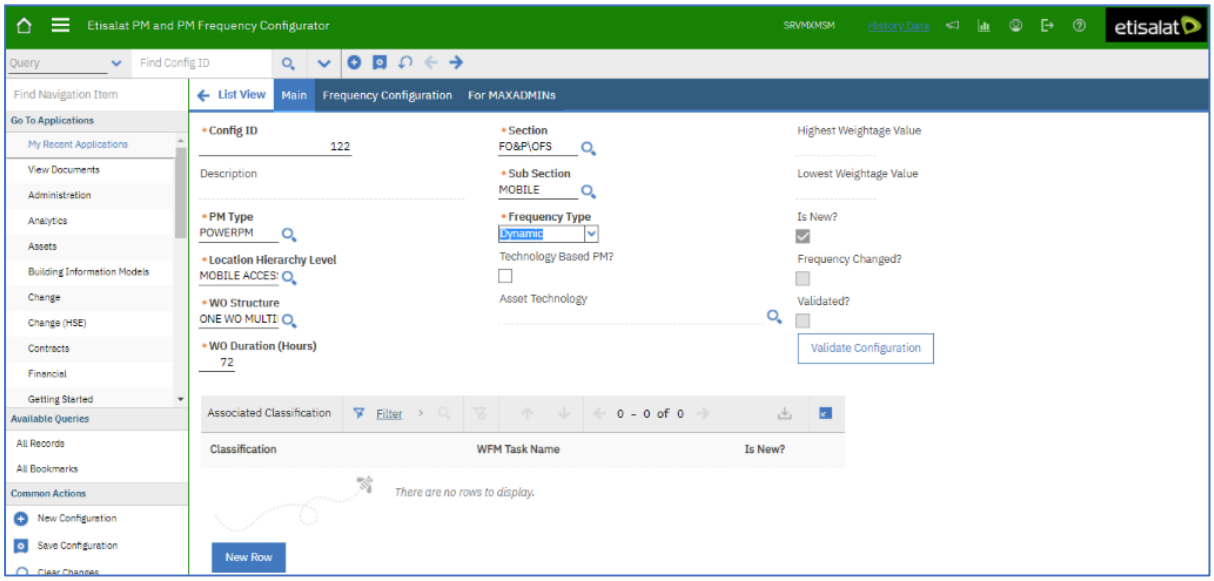
- Location Hierarchy Level: User can select location as either EXCHANGE/BUILDING or MOBILE ACCESS.



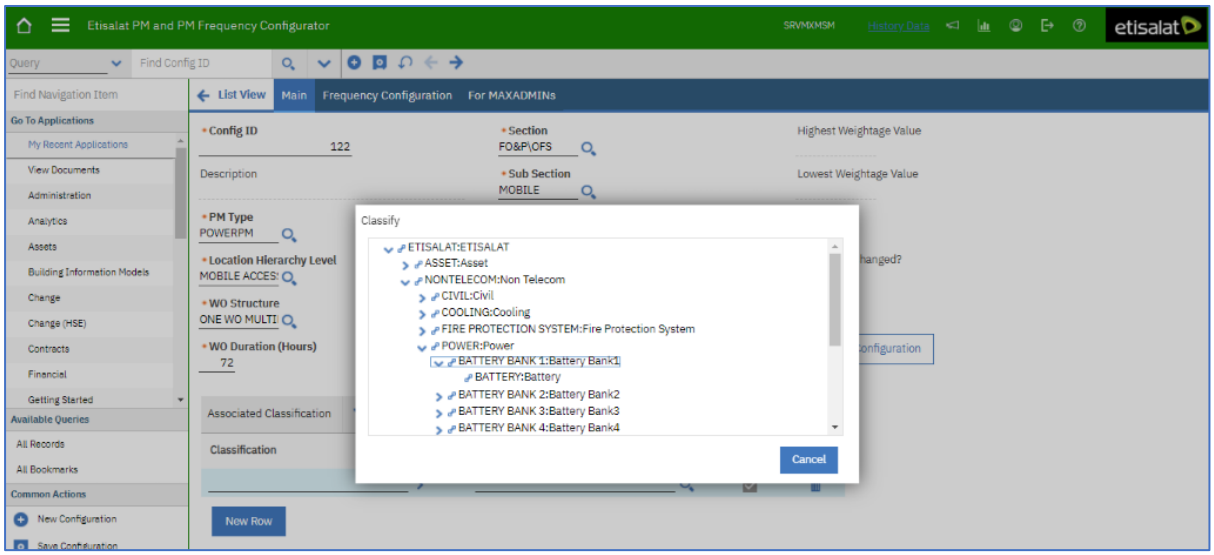
- WO Structure: User can select WO Structure from any of the three options provided: MULTIPLE WO ONE TASK, ONE WO MULTIPLE TASK, ONE WO ONE TASK. Based on selected WO Structure, tasks will be created on WO.

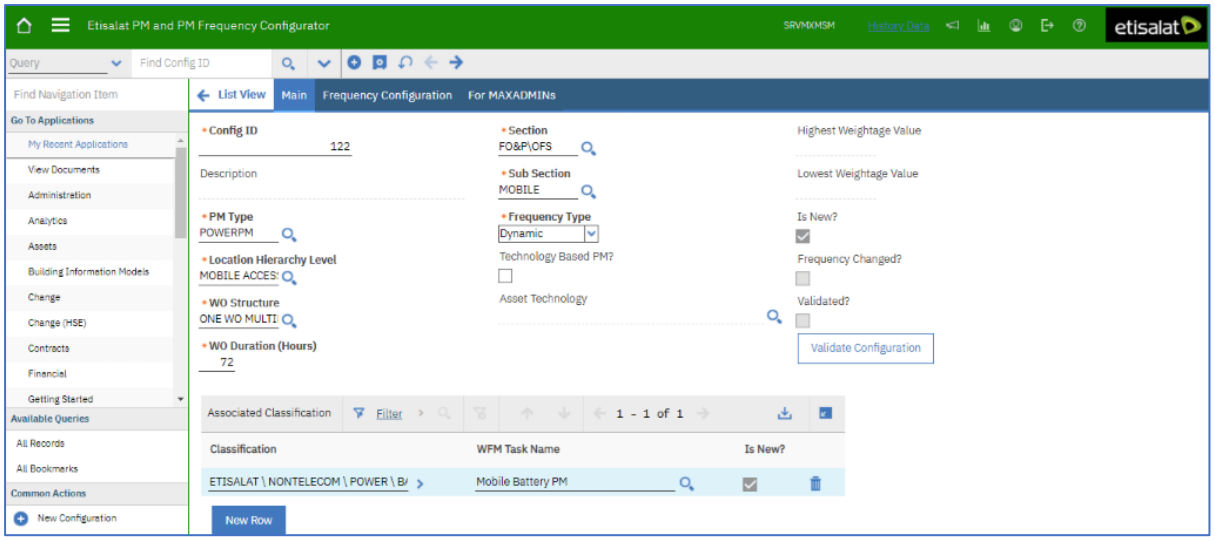


- User can select Section, Sub Section and Frequency Type (Dynamic/Fixed) as shown below:

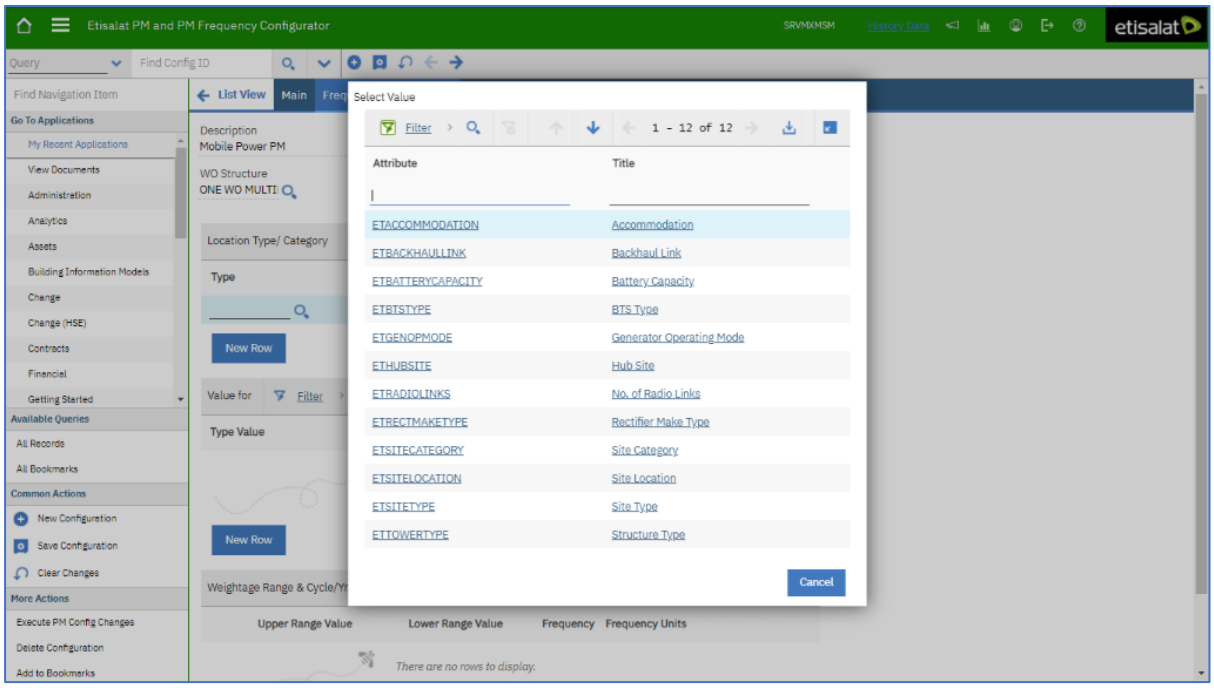


- Classification: User can associate one or more classification(s) from the classification tree applicable for PMs generation. User also chooses WFM Task Name from the provided list.

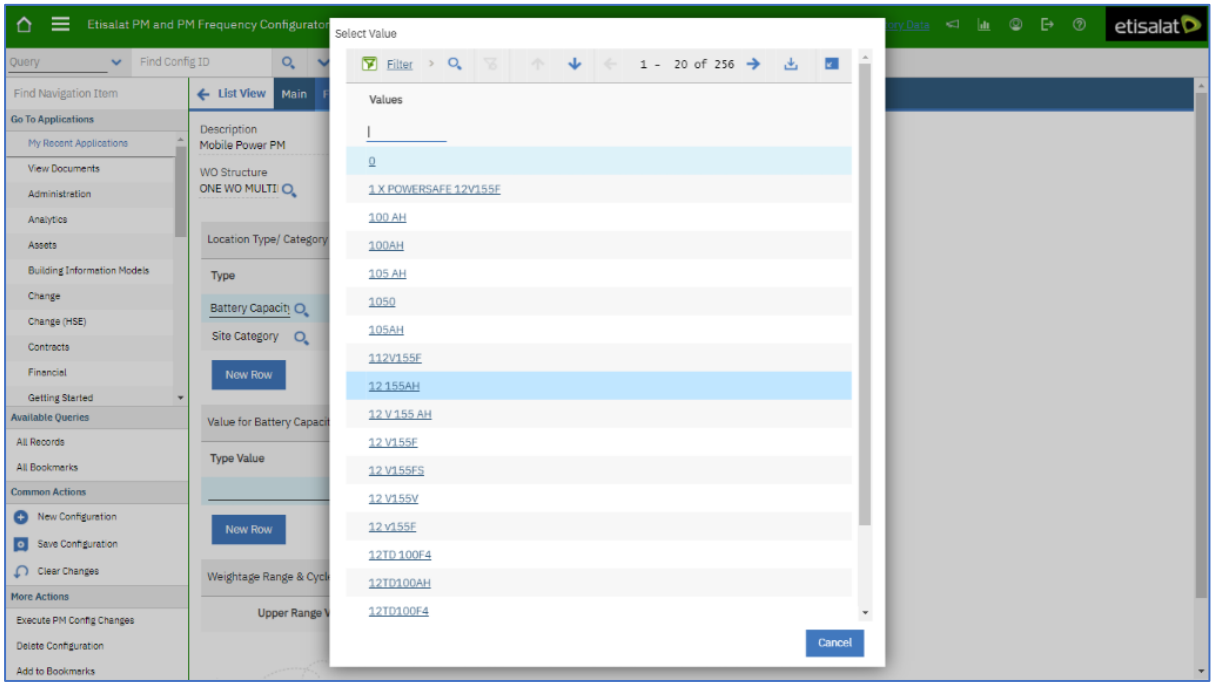




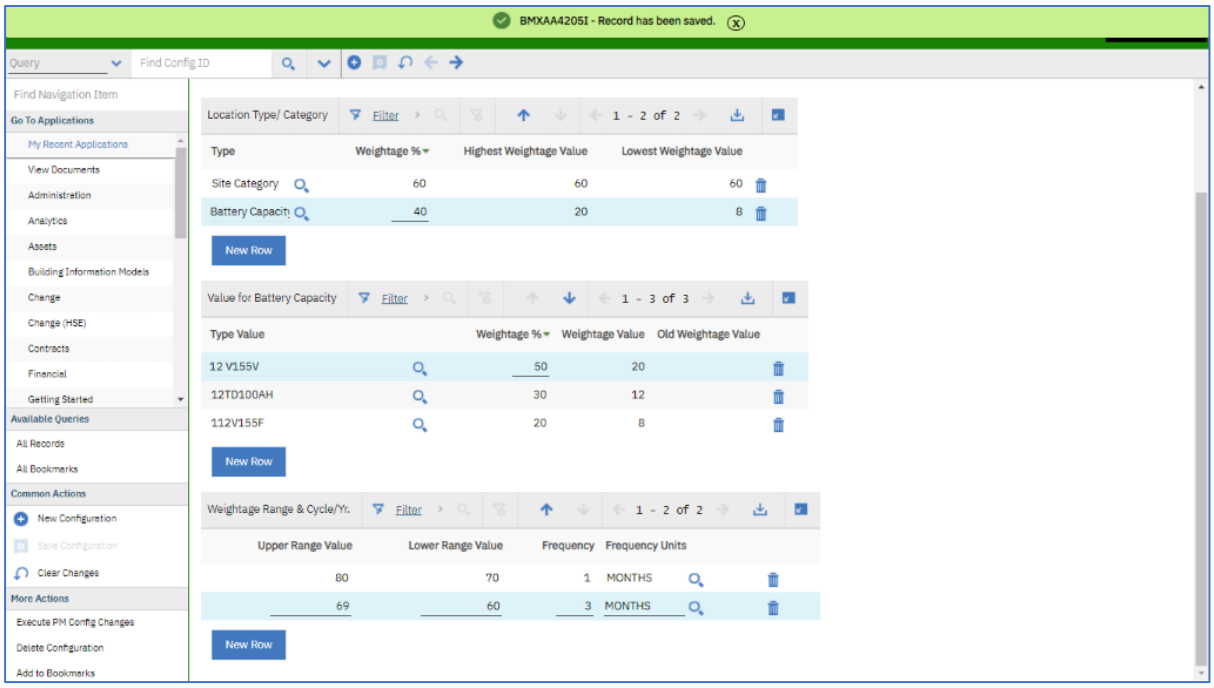
- If Frequency Type is chosen as ‘Dynamic’, User has to select the Frequency Parameters from the list of 12 parameters in Frequency Configuration Tab and associate weightage % to each selected parameter value. (Sum of all weightage % should equal to 100)



- User can then select type value against each parameter value selected from the list and associate weightage percentage to it. (Sum of all weightage % should equal to 100)



- User can then define Frequency Range in Weightage Range & Cycle section according to which WO's are generated automatically.



2. User can also update existing configuration records in following ways:
   i. WO Structure: Change in WO Structure updates the corresponding Routes immediately. Also associated PMs will be updated accordingly and future PM WO and tasks will be generated according to updated value.
   ii. Frequency Type: If Frequency type is modified from 'Dynamic' to 'Fixed', User will be able to enter the Frequency Value according to which future PM WOs are generated. If Frequency type is modified from 'Fixed' to 'Dynamic', User will be able to choose the Frequency parameter values and its corresponding type value. Next PM WOs will be generated according to provided Frequency Range.
   iii. If any one of the Frequency parameters is modified, then associated PM records are also updated accordingly and further WOs are generated based on updated Frequency.
   iv. Addition/Deletion of Classification: Addition of classification is done overnight through background job. Deleting existing classification will also delete the route stops, assets associated to that classification in corresponding route.
   v. Task Name: Change in Task Name also updates corresponding Route record immediately.

3. User finally validates configuration (via Validate button). In case the configuration is new or has been updated, a background job gets executes overnight and perform following operations-

a. If configuration is new – creates new PM and routes based on the configuration specification. The background job creates one PM and route per location and has assets as per the classification associated to the configuration. The background job also set PM frequency –
    i. If configuration frequency type is 'FIXED', the same frequency is applied to all PMs
    ii. If the configuration frequency type is 'DYNAMIC' - for each PM, overall weightage is calculated for the location (i.e. each parameter value defined in configuration are matched with corresponding parameter value of PM's location and corresponding weightage value are summed up) and the applicable weightage range is identified from the configuration itself. Thus, the frequency defined for the matching weightage range is set as PM frequency.

b. If the configuration is an existing configuration and has been updated (as per possible changes defined in section 2), following operations are performed-
    i. Create new PM - if the configuration has updates that covers locations that were not covered earlier. This usually happens when a new classification is associated to the configuration. Or when new parameter or parameter value has been added to the configuration.
    ii. Updates PM frequencies (as defined above in section 3-a-i and 3-a-ii)
    iii. Deactivates PMs - if the configuration has updates that does not covers locations that were covered earlier. This usually happens when an existing classification is removed from the configuration. Or when parameter(s) or parameter value has been removed from the configuration.

4. When an asset is created newly in an operation location or asset is moved to an operation location within Maximo, following operations are performed-
    a. The background job finds an applicable PM and route as per defined configuration and add the asset to that PM and route. The impact is the future PM WO will consider the newly added asset for maintenance and the asset is updated with last PM WO details on WO completion.
    b. If the background job is unable to find an applicable PM and Route (PM and route for the Asset's location doesn't exist) but the configuration covers the Asset's location (as per configuration, the location should have a PM and Route), the background job creates new PM for that location and add the asset into that PM (all the steps defined

in 3-a are executed for single location.). This case happens when a new operating location all together is added in Maximo and the asset is the very first asset installed in that new location.

5. When a location's frequency parameter values are updated in Maximo (via MNIS for mobile sites or user manually updates them on Fixed exchange location), following operations are performed via background job-
    a. If the location has PMs generation against a configuration, location parameter(s) are validate and matched against PMs's Configuration parameters and its values.
        i. If the validation is successful, PM's frequency is updated (as defined above in section 3-a-i and 3-a-ii)
        ii. If validation is unsuccessful, the PM is deactivated. This usually happens when location's new parameter value has not been defined with a weightage in the configuration.
    b. If the location does not have PM but should have one as per defined configurations, then the background job creates a PM and route and set PM frequency (as defined above in section 3-a-i and 3-a-ii). This usually happens when the location's old parameter value where not been defined with a weightage in the configuration and new parameter value has not been defined with a weightage in the configuration.
6. PM WO generation and execution. PM WO are generated in WSCH status and 6 days prior to the schedule defined on the PM. Once WOs are generated, a background job will change WO status to 'ASSIGNED' and send to SM/FSM for execution. Once FE completes the task(s) in SM, corresponding Asset(s) in Maximo will be updated with last PM wo details.

6 Exception Handling

Failure	Solution
Data source from MNIS to Location & Asset (for Mobile locations)	Data needs to be entered manually into location and asset
Location and Asset data input for PM & Routes Creation & Update	NA
PM & Routes Creation and updates through configurator	NA
Maximo PM WO & Task Creation via background job	PM WO should be generated manually in Maximo
SM/FSM integration failure: WO & Task Creation in SM/FSM	WO & Task Creation in SM/FSM should be created manually
SM/FSM integration failure: WO & Task Update & Completion	Update should be done manually into Maximo

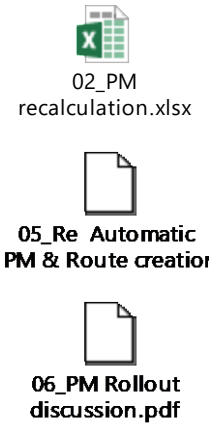
7 Solution Dependencies

Dependency Id	Dependency Description	Support Required From	Date of Origin
1	MNIS Integration should be established for mobile data		
2	User should be able to enter parameter data for fixed sites manually in Maximo		
3	WFM Task Type should be updated in Maximo		
4	Customer should be able to define Configuration		
5	There should be more number of assets in location applicable for maintenance as per defined configurations		
6	Asset movement should happen against WO		
7	Need Last PM date from Customer		

8 System Test & Use Case

PM_Configurator and Location and as

9 End User Walkthrough



10 Cutover & Roll Out

Insert the cutover plan

11 UAT

The User acceptance testing will be carried out by the SMEs who have given requirements on a given business service, who will be using the application. The project team will provide all the required support to ensure that UAT is complete as per the predefined schedule. The UAT users' availability is secured in advance. The UAT test cases are prepared and signed off by the Etisalat OFS business before starting the UAT.

Embed UAT test cases or UAT MoM or email

PM Config UAT Observations.xlsx

12 Training

Training will be provided in train the trainer mode for the new modules and functionalities. The necessary training documentation will also be shared.

Training Topic	Training Audience	Training Date Planned	Trainer

Insert email on training acceptance

NA

13 Open Action Points

S No	Open Point	Pending with Team
1.	WO Duration: User should be able to enter number of days instead on number of hours.	Etisalat & TCS (decision pending for change implementation)
2.	Multiple Technology selection should be possible, currently only one technology can be selected	Etisalat & TCS (decision pending for change implementation)
3.	Technology can be selected for all PM types, currently it is enabled for Telecom PM only.	Etisalat & TCS (decision pending for change implementation)
4.	The application should have provision to give provide weightage percentage to asset's technology (Example: DWDM will have 70%, 5G will have 30%). Currently the bases of the application is location's parameters only. However, Configuration can be created for a specific technology and considered as 100 % for the technology. For another technology another configuration can be defined.	Etisalat & TCS (decision pending for change implementation)
5.	Deletion of last classification should be restricted, currently user is able to delete all associated classifications.	Etisalat & TCS (decision pending for change implementation)
6.	There should be provision in application to perform mathematical calculation for weightages (Example. parameter value greater then 2 should have weightage 10%). Currently the application is designed to perform string comparison.	Etisalat & TCS (decision pending for change implementation)
7.	Customer should be able to group the parameter values and give a single weightage % to it. Eg-P1 & P2: 60, C1 & C2: 40.	Etisalat & TCS (decision pending for change implementation)

8.	There should be provision in application to provide weightages as 'Other' (Example. parameter value for Site category as P1 & P2 = 50%, C1 = 30% and 'Other' as 20 %), the 'Other should include all remaining values that are not specifically defined in the weightage list'. Currently the application is designed to perform named string comparison based.	Etisalat & TCS (decision pending for change implementation)
9.	After any change in configuration, user should be prompted to either saving the changes or discarding it after validation (Double confirmation needed)	Etisalat & TCS (decision pending for change implementation)
10.	In list View of Configurator Application, Summary about each configuration should be displayed (Ex-No of Routes, No of PM exist for each configuration)	Etisalat & TCS (decision pending for change implementation)
11.	In configurator application, mandatory filters to select region, sub-region should be provided.	Etisalat & TCS (decision pending for change implementation)
12.	User should be able to create new Manual WO for PM directly from WO application. It should be possible to create one or more tasks for this WO manually and select the task types manually for each task type. This new manual WO, the WO type sent to FSM will be same as the PM WO.	Etisalat & TCS (decision pending for change implementation)
13.	Verification status of Asset should not be considered for PM. Asset selection should be based on Asset status only: Assets in status OPERATING or POWERED OFF should be considered.	Etisalat & TCS (decision pending for change implementation)
14.	In Route Application, provide user-friendly description to specify WO structure (description	Etisalat & TCS (decision pending for change implementation)

	that matches with Configurator Application's WO Structure field options)	
15.	Add a status field in Configurator Application to specify the status of PM.Five status discussed were:DRAFT,APPLY,PENDING CHANGES, ACTIVE, SUSPEND. To be discussed in detail.	Etisalat & TCS (decision pending for change implementation)
16.	For One WO One Task, Value of task name should automatically populate for second classification.	Etisalat & TCS (decision pending for change implementation)
17.	New parameter should be added i.e Power Source. The data for this data should be added from Maximo. The logic to populate data from Maximo needs to be discussed with customer.	Etisalat & TCS (decision pending for change implementation)
18.	New parameter for Tower Type to be added. Existing field for Structure Type is Tower Type. The data for this parameter should come from Maximo.	Etisalat & TCS (decision pending for change implementation)
19.	Change in UI: Length of the fields with value should be increased for its clear visibility. Eg: WO Structure	Etisalat & TCS (decision pending for change implementation)
20.	User should be able to select parent classification in Configuration. Eg: Battery Bank1 (has multiple assets under it). Route should be created for that classification and not for the assets under classification. Task will be created for higher classification and not the assets at child classification When task & WO are completed, the asset last maintenance history for all the assets under the higher classification should be updated. There will be no provision to exclude any of child classification if parent classification is chosen.	Etisalat & TCS (decision pending for change implementation)

	Technology should be brought at classification level	
21.	Once the parent classification is added, it's child classification should not be selectable in the same configuration. But in another configuration, it'll be allowed to select same parent or its child classifications with another task type in a different configurations	Etisalat & TCS (decision pending for change implementation)
22.	In Configurator application, the Upper Range Value should also accept '100'.	Etisalat & TCS (decision pending for change implementation)
23.	WO Duration field should be available against each Frequency Range if Frequency type is Dynamic.	Etisalat & TCS (decision pending for change implementation)
24.	All the PM's and Route records that are created through configurator application should be read only.	Etisalat & TCS (decision pending for change implementation)
25.	Provision to deactivate existing PM from configurator	Etisalat & TCS (decision pending for change implementation)
26.	Same class of different Task type can exist in another route.	Etisalat & TCS (decision pending for change implementation)
27.	When PM generated manually, the user should be asked to enter WO target date as required	Etisalat & TCS (decision pending for change implementation)

14 Assumptions

S.No	Assumption Description
01	For Fixed Exchange sites, User needs to update parameter value manually at 'EXCHANGE/BUILDING' location only. Entering of parameter value at floor or room will not be provided.

15 Gaps

Requirement Number	Requirement Description	Requirement Type

Update if applicable

NA