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| **Revision:** | Draft Rev C, 30 Apr 13 |

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1. Purpose

This standard operating procedure describes the required process for providing and maintaining factory data captured by the HP Integrated Quality Data Collection (IQDC) systems.

1. Scope

This procedure applies to processes and personnel responsible for the content, validation, delivery, maintenance, and programming of (shop floor) factory data collection systems from all HP manufacturing sites, HP contract manufacturing (CM) sites and HP’s original equipment manufacturing (OEM) and original equipment design manufacturing (ODM) sites.

1. Responsibility
   1. PPS Operations Supply Chain Engineering and Quality and ISS Supply Chain Engineering - WW Infrastructure and Strategy are responsible for defining the data capture strategy, establishing implementation plans and schedules, reporting site status and data results, and developing integrity verification plans and process improvements. PPS and ISS supply chain groups need to designate an IQDC coordinator.
   2. HP Supply Chain Delivery Solutions and Business Intelligence (SC & BI IT) shall designate an IQDC Technical (support) team. This team is responsible for maintaining the database infrastructure, defining the format and schedule of transmitted data files, validating data, supplying feedback to sites and other organizations with regards to invalid or incomplete data, assigning site values or codes, where necessary for database integrity, and developing processes to aid in the maintenance and quality assurance of information.
   3. Global Business Units (GBUs) are responsible for identifying business needs for product-specific metrics and recommending goals.
   4. Regional and GBU Supply Chains are responsible for communicating the requirements of this document to their respective HP CM, ODM, and OEM Site Operations; ensuring the respective sites’ implementation and compliance with these requirements; identifying and driving process improvements to bring sites into compliance with these requirements; and providing continuous improvement feedback to the IQDC coordinator or IQDC technical support team.
   5. HP CM, ODM, and OEM Site Operations are responsible for compliance with the requirements detailed in this procedure and any applicable contracts; for providing modifications to systems, processes, or programs necessary to deliver factory data to the HP IQDC system; for tracking 100% of units through all manufacturing test, repair, and audit stations; for tracking all defined subassembly information; for tracking all repair activity including any replaced sub-assembly information, for systematically supplying HP with manufacturing performance and quality data in a format and schedule designated by HP; and for ensuring the accuracy of data transmitted to HP.
2. Definitions
   1. Audit − A test or inspection performed on a sample (a portion less than 100%) of finished units as an assessment of outgoing quality. These checks are performed on units to test for functionality and visual, mechanical, and packaging issues.
   2. Cannot Duplicate (CND) – A failure that is not observed at repair. The repair code in IQDC, in this case, should be FALSE.
   3. Component Tracking Label (CT Label) – HP 185411 Standard serialization.
   4. First Pass Fallout (FPF) – Failures occurring during the first pass, before, and including pack (audits not included).
   5. NC\_CODE (Non-Conformance code or failure code) – A code corresponding to a description explaining the reason for the failure.
   6. OPERATION – A manufacturing event in which subassembly integration takes place or in which pass/fail criteria are met, such as in a test or inspection.
   7. REPAIR\_CODE – A code corresponding to a description explaining the repair action.
   8. Subassembly Tracking (SAT) – Component information as defined by HP supply chain organizations and GBUs for the identification of consumed commodities
   9. VISIT\_NUMBER – A number used to denote a stage in the manufacturing process. All operations before and including pack will have value = 1. The value increases by one increment at each subsequent audit.
   10. Work In Progress (WIP) – Denotes a unit that is not yet completed.
3. References

N/A

1. General
   1. Business Rules
      1. Each unit is tracked only once and has a distinct part number and serial number.
      2. Each unit can undergo several operations and may have several subassemblies.
      3. There are two main categories of operations: FPF (First Pass Fallout) operations (that is, anything before and including the packing) and Non-FPF operations (Audit and other operations repeated after an audit). FPF operations are identified in the records by assigning a VISIT\_NUMBER =1. Each additional audit after the first manufacturing pass must increase the visit number by one. See section 6.2.3 for more detail about FPF and Non-FPF operations.
      4. Any percentage of the units can go through one or multiple audits.
      5. The unit may re-enter the cycle for repair after an audit.
      6. A failure code is associated with the operation where the failure occurred.
      7. There can be several failures in one unit.
      8. There can be multiple repairs for one failure but one repair cannot resolve multiple failures.
      9. Multiple subassemblies may be installed in one unit by sending multiple records. One record must be sent for each component serial number, each having a quantity of one.
      10. HP part numbers should be used to identify final shipping product (SKU) and commodities (components). OEM, ODM, and CM part numbers are not recognized in HP product hierarchy or commodity tables and should not be transmitted to IQDC.
   2. Site Orientation
      1. The **Location Hierarchy** must be set up for each new site. The *buildshift* and *opershift* consist of four fields parsed together: Business – Corporate Quality team determines names (CPU – PSG, SYS – ESG)

Plant – Corporate Quality team determines names (3 characters)

Line – Site determines number and name of lines (4 characters)

Shift – Site determines number and name of shifts (1 character)

* + 1. **NC Codes** (failure or nonconformance codes) and **Repair codes** (**Guide** **Action** codes) with descriptions must be sent before a new site can “go live.” The HP IQDC technical team may ask the site to prefix these codes with the ‘Plant’ value to prevent codes from overlapping with the NC Code from another site. These descriptions should be in English.
    2. **Operations** must be one of two categories, “FPF type” and “Non-FPF type.” FPF-type operations will be used in the calculation of the first pass fallout metric.
       1. FPFis defined as “A defect that occurs before and including the first pack operation (visit = 1).” (See section 6.1.3.)
       2. Non-FPF operations are “Audit type” and otheroperations that are repeated due to an audit failure.
       3. Any “Audit type” operation (see section 4.1) performed as an assessment of outgoing quality, **whether the unit has been packed or not**, will be assigned visit 2 or higher, as appropriate. Once the unit’s visit number is greater than 1, the unit’s visit must remain at that or a higher visit number. It will not be considered as “FPF type” again. **Any tests or repairs repeated after audit will retain the audit visit number.** The visit number increases by one increment each time a new audit is performed.
    3. “Audit type” operations, such as FPIA, JICS, OTHERS, E-FPIA, CIA, CDIT, FAT, FA, PAT, PA, and STAGE 2 AUDIT are not added to FPF calculations. Certain site audit operations may require an alias where audit names conflict with other established IQDC audit names.
    4. Do not send WIP data – Only send data with the correct completion date after the Unit is PACKED (completed).
  1. Technical Specifications
     1. Types of records: The file will contain five types of records: Operation, Failure, Repair, Audit, and SAT **Record\_Types.xls** contains examples for the records. (See section 9.1.)
        1. Operation records (also referred to as header information) must include the following fields:   
           SERIAL\_NUMBER  
           PART\_NUMBER  
           BUILD\_SHIFT  
           SFT\_COMP\_DATE  
           SFT\_START\_DATE  
           START\_DATE  
           COMPLETE\_DATE  
           VISIT\_NUMBER  
           OPER\_SHIFT  
           OPER\_DATE   
           OPERATION  
             
           Optional fields are:  
           OPER\_RESRCE  
           SFT\_OPER\_DATE  
           OPERATOR
        2. Failure records include all of the operation data from Operations (header) plus NC\_CODE and NC\_GROUP.   
             
           Optional: NC\_COMMENT fields are optional to explain details of the failure.
        3. Repair records include all of the operation data from Operations (header) plus NC\_CODE and REPAIR\_CODE. Refer to section 6.3.4 for details about reporting parts replacements. The name of the repair station may be recorded in the OPER\_RESRCE field if desired. The NC\_COMMENT fields are available to record repair comments or actions.
        4. Audit records include all of the Operation data (header) plus the VISIT\_NUMBER, which must be increased to the proper value for each audit.
        5. SAT records using HP standard CT labels (see section 4.3) include all of the operation data from Operations (header) plus COMP\_SN and STATUS fields.
        6. For SAT records where subassemblies **do not** use the HP standard CT label, the record should include all of the operation data from Operations (header) plus the following fields:  
           COMP\_SN  
           COMP\_PART  
           ASSLY\_CD (where ASSLY\_CD = X)  
           COMMODITY\_TYPE  
           SUPPLIER\_CODE   
           STATUS (= ACTIVE)   
             
           A list of commodity type codes is provided in section 9.2.
     2. Each failure and its corresponding repair must have the same NC\_CODE, OPERATION, and VISIT\_NUMBER.
     3. The failure and repair record must have the operation at which the failure occurred. For a failure record, NC\_GROUP and NC\_CODE are mandatory (REPAIR\_CODE must be empty).   
          
        For a repair record, NC\_CODE and REPAIR\_CODE are mandatory (NC\_GROUP must be empty).
     4. Repair records: There are four possible repair records:
        1. When a CT labeled component is replaced: Populate COMP\_SN (of the defective component) and STATUS=REPLACED.
        2. When a non-CT labeled component is replaced: Populate COMP\_SN and COMP\_PART (of the defective component), ASSLY\_CD=X, COMMODITY\_TYPE, SUPPLIER\_CODE, and STATUS=REPLACED. SUPPLIER\_CODE values will be provided by the IQDC Technical team or IQDC Coordinator after receiving a list of commodities and their suppliers. (This must be done only when sending non-CT labeled component data.)
        3. When a nonserialized component is replaced: Populate COMP\_PART (of the defective component). Leave COMP\_SN, STATUS, and other SAT fields empty.
        4. When a component is not replaced: Leave all fields after REPAIR\_CODE empty.
     5. When a serialized component is replaced, the repair record can be followed by another SAT record with the new component (with STATUS=ACTIVE). **Example\_Failures.xls** illustrates these with examples. (See section 9.3.)
     6. SAT (Sub-Assembly Tracking) – The file **iqdc\_sat\_specs.ppt** provides more detail about how to send SAT data and how to distinguish a CT label from a non-CT label. CT label is the component serial number in HP format. (See section 9.4.)
     7. Data file output must be in the required format which uses a caret   
        ( ^ ) delimiter, as shown in the following sample records:

JPA40808RR^DB670AV^CPUOJP00011^20040228^20040227^20040227092503^20040228030711^1^CPUOJP00013^20040227092503^JDFC\_MNF01\_QUEUE^^^^0^^^^^^^^^^^^^^^^^^

JPA40808RR^DB670AV^CPUOJP00011^20040228^20040227^20040227092503^20040228030711^1^CPUOJP00013^20040227134259^JDFC\_MNF01\_BUILD1^^^^0^^^^^^^^76C4905D5PB58L^217396-9D0^^^^^^^^^ACTIVE

JPA40808RR^DB670AV^CPUOJP00011^20040228^20040227^20040227092503^20040228030711^1^CPUOJP00013^20040227134259^JDFC\_MNF01\_BUILD1^^^^0^^^^^^^^25344F13HPU6EQ^258328-001^^^^^^^^^ACTIVE

JPA40808RR^DB670AV^CPUOJP00011^20040228^20040227^20040227092503^20040228030711^1^CPUOJP00013^20040227134259^JDFC\_MNF01\_BUILD1^^^^0^^^^^^^^P6B25B3REPP9ME^301682-001^^^^^^^^^ACTIVE

* + 1. **Definitions\_New.doc** provides the table fields that are populated in the IQDC database. (See section 9.5.)

1. Procedure
   1. The HP IQDC Technical team and HP IQDC coordinator designate the HP implementation team for all new site start-ups. The Site is responsible for appointing a site implementation team to deliver the requirements as described in this document. HP product divisions may amend these requirements to satisfy specific business needs of the HP GBU.
   2. The Site shall provide the HP IQDC Technical team with list of failure and repair codes and operations. Descriptions of the codes must accompany the list. Some audit operations may need to be aliased.
   3. The Site will provide test files for the HP IQDC Technical team to validate and provide feedback. This will be an ongoing process until the site goes live.
   4. Once the Site goes live, the HP IQDC Technical team will provide the production upload destination details and the site must send a file with the previous day’s completions each day at the same time.
   5. The Site will send daily files named XXSFDMTYP.TXT (all uppercase) where the first two characters (XX) will be site-specific. The characters will be assigned by the HP IQDC Technical team. If sending more than one file on a day (missing or resent data), the Site needs to follow the convention SFDM\_XX.YYYYMMDD.TXT to prevent overwriting files (XX are the letters assigned to that site and YYYYMMDD is the shift completion date of the units in the file.) One day’s data should be in each file. Alliance partner sites (any non-HP managed factory), must prefix each file name with **IQDC** followed by “**.**” for proper routing of data files. Example,   
      **IQDC.** **XXSFDMTYP.TXT** and **IQDC.SFDM\_XX.YYYYMMDD.TXT** (bolding added for emphasis).
   6. If data needs to be transferred again, the IQDC system will delete and replace any data with the same serial number, part number, and visit number. If only the visit number is different, the new data will be appended to the existing data.
   7. The Site will also supply the names and e-mail addresses of three IT persons responsible for sustaining the data feed after implementation is complete.
   8. The IQDC system will send automated support emails to the site whenever a file is not received or a file fails to load. There are two types of messages: ERRORS and WARNINGS. If a file has more than 20 units containing records with errors, the entire file is rejected and has to be resent after correcting the error. If there are 20 or fewer units containing records with errors, only the erroneous units will be filtered and the rest of the units in file will be loaded. These erroneous units must be resent after correcting the error. WARNINGS represent omissions or deviations that should be corrected as soon as possible. Warnings shall not cause the unit to be rejected. Errors and warnings are listed in **Validations\_New.xls.** (See section 9.6.)
   9. The IQDC system will also send a weekly and monthly data audit email to the site with the number of units built each day. If there is a mismatch in the counts for any particular day, the site must correct the discrepancy by retransmitting the data for that day.
   10. For the monthly data audit report, the Site must reply to the HP IQDC support team within two days and confirm that the counts are correct for all days noted in the audit.
2. Records
   1. All factory shop floor system data shall be retained by the HP CM, ODM, and OEM sites for a period of no less than six months in case replacement records need to be retransmitted.
3. Attachments

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| 9.1 | **Record\_Types.xls** contains examples for the records. |  |
| 9.2 | **Commodity\_Type.xls** describes all commodity types and their descriptions. |  |
| 9.3 | **Example\_Failures.xls** lists examples of all the cases when a failure occurs and identifies how to send failure and repair records in each of these cases. |  |
| 9.4 | **Iqdc\_Sat\_Specs.ppt** gives more detail about how to send SAT and how to distinguish a CT label from non-CT label. |  |
| 9.5 | **Definitions\_new.doc** describes all fields in the table. |  |
| 9.6 | **Validations\_New.xls** lists all the errors and warnings. |  |
| 9.7 | **BsAM.doc** Bulk Ship and Merge requirements. |



## Revision History

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| --- | --- | --- | --- | --- |
| Revision | DCN Number | Description of Change | Checked By | Date |
| A |  | Initial release | EF | 19-Jul-2004 |
| B | 02817 | Minor change in sections 7.4 and 7.5 to Update data file name convention for IT compatibility. Minor format change in Attachment files. | JL | 19-Sep-2006 |
|  |  | 03-Nov-2011: Document was reaffirmed by Maintainer as current. Owner Changed to David Rentschler | BB | 03-Nov-2011 |
| C | 13005 | Add Bulk Ship and Merge (BSaM) requirements in Attachment 9.7  Add BSaM requirement in the Description column for OPER\_RESRCE field in Attachment 9.6 | BM | 30-Apr-2013 |