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## 200   EQUIPMENT NUMBERING AND LABELING

## CONTACT THE CM STANDARDS POC
for upkeep, interpretation, and variance issues

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| **Ch. 1, 200** | **ESM Component Nomenclature Committee** |

## REVISION RECORD

| Rev | Date | Description | POC | OIC |
|---|---|---|---|---|
| 0 | 9/26/01 | Initial issue as Chapter 1 Section 230, Component Nomenclature | Tobin Oruch, *FWO-SEM* | Mitch Harris, *FWO-SEM* |
| 1 | 5/22/02 | Adopted acronyms used frequently at LANL historically. | Tobin Oruch, *FWO-SEM* | Kurt Beckman, *FWO-SEM* |
| 2 | 11/18/02 | Eliminated unused/hardly-used historical acronyms, added shop equipment, other IDs | Tobin Oruch, *FWO-SEM* | Kurt Beckman, *FWO-SEM* |
| 3 | 2/9/04 | Body: loop numbering guidance; converted appendices to atts and reordered; clarified acronym disciplines are typical, not binding; added/clarified several fire acronyms. | Tobin Oruch, *FWO-DO* | Gurinder Grewal, *FWO-DO* |
| 4 | 8/16/04 | Changed suggested CMMS/MEL use of IDs to reference FWO IFMP Procedure AP-MNT-10. ID lists (App A) do not require ESB meeting prior to approval by Chief Engineer. | Tobin Oruch, *FWO-DO* | Gurinder Grewal, *FWO-DO* |
| 5 | 5/18/05 | This section split off from Section 230 which became Functional ID listings only. Organizational and URL changes. | Tobin Oruch, *ENG-CE* | Gurinder Grewal, *ENG-CE* |
| 6 | 10/27/06 | Organizational, URL, spec number changes. | Tobin Oruch, *CENG-OFF* | Kirk Christensen, *CENG-OFF* |
| 7 | 6/16/2008 | Clarified existing facility use, added CLI term, addressed sequence number reuse, other minor clarifications. | Tobin Oruch, *CENG-OFF* | Kirk Christensen, *CENG-OFF* |

## 200     EQUIPMENT NUMBERING AND LABELING

This Section addresses the general requirements for labeling systems, equipment, and components. Tech Area, building, and room signage is addressed by ESM Chapter 4, Architectural.

### 1.0    DEFINITIONS

| | |
|---|---|
| **CLI** | Component location identifier, the system--function ID--number string defined by this document |
| **FMU** | Facility Management Unit; a site portion having the same management/maintenance program |
| **M&TE** | Measuring and Test Equipment; items are generally portable |
| **MEL** | Master Equipment List |
| **TA** | Technical Area (e.g, TA-3) |

### 2.0    EXISTING FACILITY EXCEPTIONS

A. For existing buildings, when additional components of the same type are added to a system, it is generally preferable that the existing component labeling conventions continue to be used to avoid confusion. Conversely, this document shall be followed for new components when this does not create conflict/confusion with existing components.

B. When multiple labeling conventions are in use in a facility, progression toward this institutional standard is desirable and shall be the goal.

C. When complete relabeling of a system is undertaken, current LANL standards shall be followed.

D. It may be necessary to add a system identifier to the original convention to obtain unique component identification and labels in the field. *Labels applied to the components should be a combination of the standard identification code and a concise and meaningful verbal description of the function (i.e., the noun name -- like "XXXX Feed Pump" or "Bldg XXX Main Breaker") for the item being identified.* Labeling is further addressed at the end of this document.

### 3.0    COMPONENT LOCATION IDENTIFIERS (CLI NUMBERS)

A. The component location identification (CLI) code or number shall be composed of three fields designated as "Field Label" in Figure 200-1 (System, Function ID, and Sequence Number).[1] Note: In the PassPort database, labwide uniqueness is achieved by the entry of this CLI for a given Facility (FM or FMU) and Unit (TA+Bldg).

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[1] As well as being implied by PassPort, the system-function ID-sequence number (CLI) string is suggested by ASHRAE Guideline 4-1993, Preparation of Operating and Maintenance Documentation for Building Systems, and by DOE-STD-1073-
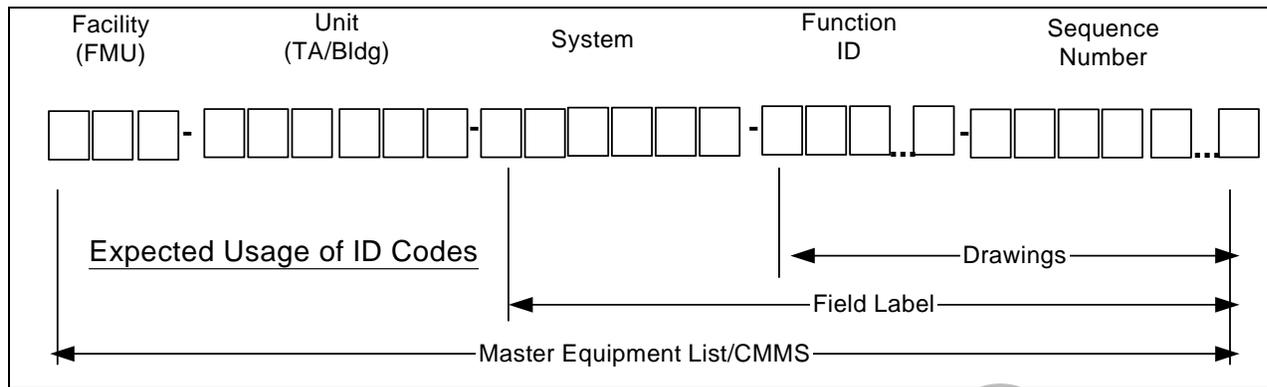
**Figure 200-1 - Identification Code**

B. System and component IDs other than those in Sections 210 and 230 may only be created and used by permission of the Chapter 1 POC.

C. MEL development and maintenance is addressed by AP-341-404 Master Equipment List

D. Explanation of the identification code fields:

**FACILITY** - Identification of the Facility Operations Directorate (formerly FMU); 3 characters maximum (*e.g., F01*). Used in LANL's PassPort database, but typically not on design documents or field labels.

**UNIT** – A concatenation of the TA and Building; maximum of 6 characters. For example, TA-3, Building 410 would be 030410. This is used in PassPort and may be omitted from each component's identification in design documents and facility procedures if the TA and Building are identified on the document (e.g., title block of drawing, header or title of procedure). *Utilities outside a building typically use 0000 for the building number; if no single TA use 000000 in PassPort.*

**SYSTEM** - Identifies the system. Acceptable system and subsystem acronyms are per ESM Chapter 1, Section 210. The system acronym alone is 2-5 letters, and the total maximum number of characters in the PassPort Operating (Op) System field is six (6).

Optional Subsystems and Suffixes

Subsystems may be entered in PassPort in the 6-character System field (in lieu of R, P, and U that has been used in the past). Section 210 lists several subsystem acronyms that can be used if a manager determines the added complexity will improve operations. In addition -- if a facility or operation desires and controls them internally – additional, non-listed subsystems can be created by adding suffixes to the approved system acronyms - as long as it does not create confusion by making the result identical to any other system/subsystem acronym already in Section 210. Dashes before suffixes are allowed.

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2003: "Unique identifiers that incorporate system designators, component type, and numbers, (e.g., SW-MOV-91) are more useful than strictly numeric identifiers (e.g., 135711317). Unique identifiers are important to support equipment and facility operations as well. See DOE O 5480.19 [Conduct of Ops] [Ch 18] for additional discussion of equipment designation and labeling."

*Guidance: For example, from looking in Section 210's Att. 1 Table 210-A1-3 Subsystem column, acceptable subsystem acronyms for hypothetical, multiple Potable Water subsystems are PW-A and even PWB (no hyphen example). However, PW-C is not because PWC is reserved for the Potable Water Cold designation on drawings, and PW-C is very similar to PWC and may cause confusion.*

*Some subsystem/drawing column listings in Section 210 Att. 1 Table 210-A1-3 are included to acknowledge and codify common drafting and field labeling practices for pipe identification (e.g., CWR for Cooling Water Return). This codification helps eliminate future conflicts similar to the PW example above. However, when a suffix is used in this way, related drawings and system design descriptions should either explain this as a drafting practice or treat them as legitimate subsystems.*

**EQUIPMENT or COMPONENT FUNCTIONAL ID** – This is the equipment or component's functional identifier, a 1-6 character alphabetic ID that identifies the function performed by the equipment or component.. *Guidance: PassPort captures this Function ID (together with the "Sequence Number" described further below) in the 15-character PassPort "Equipment"(and sometimes "Component") fields. The PassPort Type field, which contains a general category of the component, is currently listed at http://arania.lanl.gov/fmd/fmd_mse/html/fmd_msedocs.html and may be updated by the Standards Program in the future.*

The Equipment and Component Functional IDs shall be per ESM Chapter 1 Section 230.

**SEQUENCE NUMBER** – this is an alphanumeric code that ensures a unique identification for each component. This can be employed in a number of ways. *Ordinarily the Sequence Numbers are assigned beginning with 1, 01, 001, or 0001 (use of zeros is a formatting choice), and typically progress in ascending order (e.g, 1, 2, 3, etc).*

As a minimum, the Sequence Number assignment shall provide uniqueness within a System or Subsystem (in this case, the same Sequence Number can be reused with different Function IDs). *Where possible, Sequence Numbers should be chosen to be entirely unique within a system (Sequence Number is not reused when Function ID changes) and even a facility (e.g., "1" and "101" and other numbers used only once).[2]*

*Only upper-case alpha characters and numbers should be used in the makeup of a component Sequence Number. Other characters allowed are the dash (-), period (.), and ampersand ( & ). No other symbols should be used in the makeup of a component number. Non-recommended symbols include the plus (+), the under-score symbol (_), the forward or back-slash symbols ( / or \ ), single or double quotes (' or "), percent symbol (%), brackets ( [ ] ), parenthesis's [ ( ) ], etc (such symbols affect various software programs and can yield unexpected/unintended results).*

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[2] Suggestion of CMR-R Design Authority Rep to reduce possible confusion.

<u>Instrumentation Loop Numbering</u>

Beyond simply providing a unique component number, added intelligence shall be built into this field for instrumentation and may be used for other applications. Instruments in a loop shall have the same sequence number. *For example, the primary element, transmitter, controller, and final control element for a control loop should all have the same number, e.g.: TE-102, TT-102, TIC-102, and TCV-102.*

For loops with multiple components of the same type, add an upper case letter to the component number for each of the duplicate components. *For example, if there are three temperature elements, they would be TE-102A, TE-102B, and TE-102C.*

To avoid any duplication of the numbers in the master equipment list (MEL), the sequence number shall be followed by a dash and the parent component designation if present. *For example, a temperature element on HVA-1 could have a sequence number of 102A-HVA-1.*

*When utilized in a P&ID drawing, the instrument bubbles should contain the Function ID and the first part of the sequence number excluding the subsystem designation, e.g.: TE-102A. Because the P&ID drawings are typically applicable to only one subsystem, the subsystem designation will be shown in the title block and is not needed in the instrument bubbles.*

*When utilized in an instrument list applicable to multiple subsystems on a drawing, the subsystem designator can be attached with a dash or added in a separate column to ensure a unique instrument number.*

*The recommended maximum number of characters for the main Sequence Number for instruments is four plus two for alpha subcodes.*

The LANL Engineering Standards I&C POC can grant variance to the I&C sequence number requirements above.

<u>Electrical Suffixes</u>

Suffixes shall be used for electrical systems as follows:

1. Apply suffixes in ascending order, if more than one like item per structure.

2. Suffix the Sequence Numbers based on system voltage as follows (in existing facilities, coordinate the assignment of equipment code suffixes with the Facility Manager)[3]:

   - With a number if the system voltage is in excess of 1000V (e.g. 13.8 kV). Example the third 13.8 kV motor-operated disconnect switch in a substation will be identified DMO-3.

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[3] This method of designating system voltage has been used at LANL for many years per D. Powell.

- With a letter if the system voltage is in excess of 250V but less than 1000V (e.g. 480Y/277V). Example: The second 480Y/277V power panelboard in a building will be identified PP-B.

- With a number if the system voltage is 250V (e.g. 208Y/120V) or less. Example: The fourth 208V lighting panelboard in a building will be identified LP-4.

3. Add suffix IG for isolated-ground panelboards. Example: LP-1-IG.

*Other Suffix Guidance*

*A suffix may also be used as follows:*

- *Where associative coding is used to associate one or more similar components with a primary component (e.g., a parent-child relationship). Ordinarily the suffix is an alpha character. An example of this might be a primary control relay fed by an array of secondary relays: the primary might be numbered 001 while the subrelays are numbered 001A through 001Z.*

- *For certain power distribution components, it is allowable to show the alpha acronym as well the numerical device function number. For example, an AC circuit breaker Function ID might be "CBA," but it is also listed as a "52;" thus one could choose to include both in the identification code – e.g., CBA52-1.*

- *To indicate room number.*

E. Labeling/Tagging:

1. Follow labeling requirements in LANL Master Specifications 22 0554, Identification for Plumbing, HVAC, and Fire Piping and Equipment, and 26 0553, Identification for Electrical Systems; ESM Chapter 7, Electrical; and OST 310-00-00, *Conduct of Operations Implementation Manual*.

2. Additional requirements and guidance may be contained in P101-19, Safety Signs, Labels, and Tags.

F.  *Example:*

For a gas-fired furnace in TA-3-410:

PassPort Fields:

| FMU | Unit | Operating Sys | Equipment |
|------|--------|------|------|
| 81 | 030410 | HVAC | FGF-1 |

*Tag on Furnace:*

| 03                                          410 |
|---|
| HVA-FGF-1 |
| East Wing Furnace |

HVAC flow diagram's furnace symbol label or bubble:

FGF-1
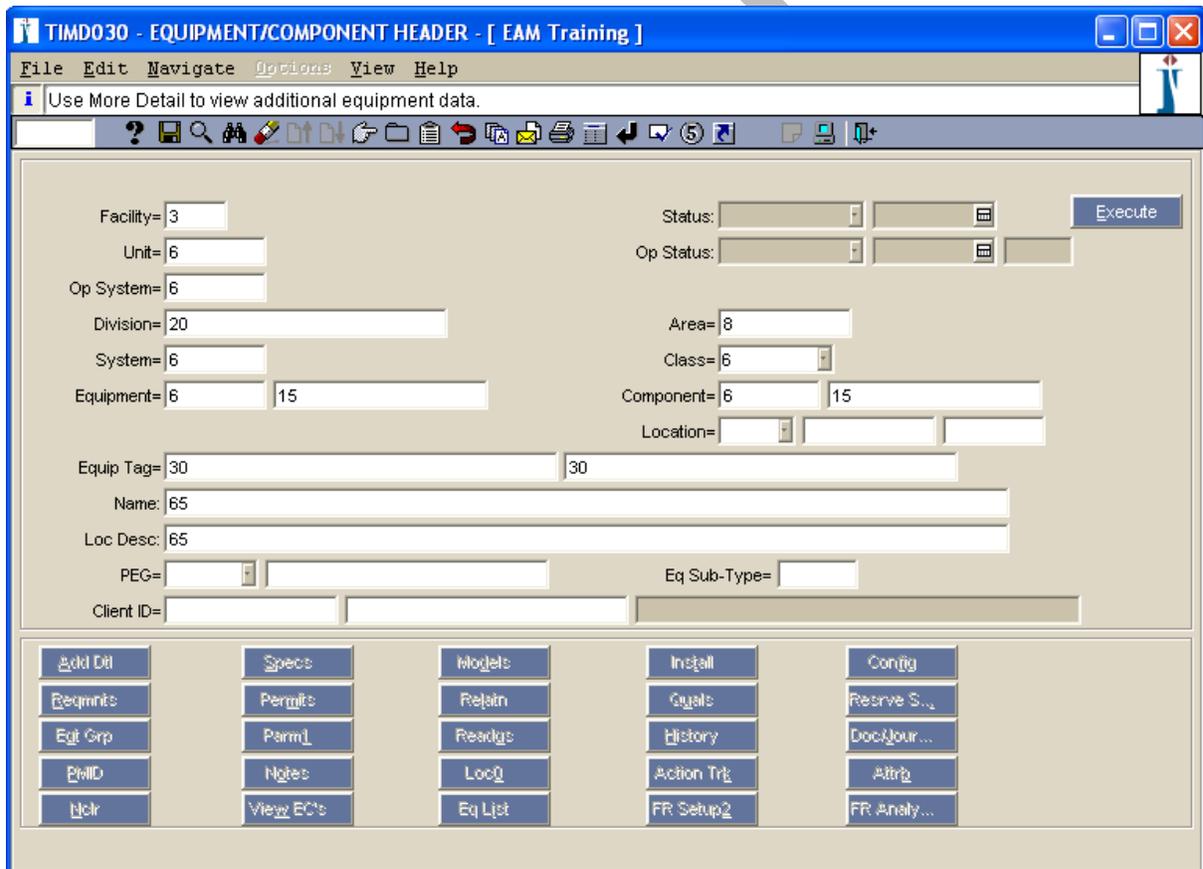


D030 - EQUIPMENT/COMPONENT HEADER - field sizes