MASTER EQUIPMENT LIST; ITEM NUMBERING AND LABELING

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Please contact the ESM Ch. 1 - CM/Nomenclature POC for interpretation, variance, and upkeep issues.

New in this revision (older revisions addressed in 10.0 Record of Revisions)

Added MEL to title. In body and App. E, clarified approval methods and recordkeeping by MSS (with other changes, completing LANL-C-2024-2597) In App. D, deleted label request directions. Also in App. E, expanded ML-4 scope for BUILDER, SAFER, and criticality safety needs (last completing LANL-IM-2024-0646-01); refined delegation approach and relaxed for ML-4; refined reconstitution priorities; referenced MSS guides. Previously separate Sections 210 and 230 controlling processes added as App. F, superseding them. App. G on field dependencies added. App. H work order example added. Throughout, acronym became abbreviation; numerous other improvements.

200   MASTER EQUIPMENT LIST; ITEM NUMBERING AND LABELING

This Section contains the requirements for identifying and labeling systems, equipment, and any components within them (hereafter "items"), populating a Project Equipment List (PEL[1]), and (for LANL personnel) development and maintenance of the LANL Master Equipment List (MEL), often based on a PEL. **It incorporates and supersedes Sections 210 and 230**.[2]

1.0   APPLICABILITY

A.   Numbering and labeling: This section, and its related subordinate Section 220, apply to all items, thus including facility, utility, environmental, and programmatic.[3]

   1.   These IDs are used on drawings, field labels, in procedures, the MEL in the computerized maintenance management system (CMMS), and for many LANL systems, in document/record names/filenames.

B.   PEL and MEL: Section 200 establishes requirements for the data in these documents.

   Exception: Those programmatic items not subject to (a) PD340, *Conduct of Engineering and Configuration Management for Facility Work* or other LANL CMMS/MEL-use requirement <u>and</u> (b) that do not warrant identification and/or MEL control per the responsible programmatic manager.[4]

C.   Project Equipment List (PEL): This dataset is defined and required by the Tailored Standards Manual and ESM Ch. 1 Section Z10. PELs are precursors (inputs) to the MEL and shall include all items specified by a design and expected to be inventoried[5] or maintained by the operating facility; PELs must follow applicable Section 200 requirements (syntax, approved abbreviations, data, etc.) so that PEL-to-MEL translation and upload to CMMS is seamless.

D.   Building Information Models (BIM, per CAD Standards Manual Section 400) must follow the conventions within; however, data transfer directly from the model to the MEL is allowed with FDAR approval.

2.0   DEFINITIONS/ABBREVIATIONS

A small selection of key terms follows. For the CMMS/MEL itself, the definition/usage expectations for each data field are described by Section 200's Att. 1 Upload Workbook (e.g., in its "Field Req'ts" tab) or, in a few cases, within Section 200 itself (e.g., App. A, Sequence

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[1] When required by TSM or ESM Ch. 1 Section Z10.

[2] Section 210/230 concept remains to ease this transition. For the former MEL AP-341-404 r2.1, Section 200 now fully supersedes/cancels it, incorporating VAR-10424 that authorized same.

[3] Programmatic types are process, R&D, and tenant per Ch. 1 Section Z10. The exception is further discussed in Appendix E regarding set-up, upkeep, and approvals. *ESM Chapter 4 Architectural addresses building and room identification and signage (wayfinding).*

[4] Consistent item numbering and labeling supports safe operations across LANL by providing uniqueness and clarity (and is a key tenet of Conduct of Operations).   This, in turn, allows capture in an MEL that controls other attributes such as management level for controlling risk. The MEL is the heart of the LANL computerized maintenance management system (CMMS) used for management of preventive and corrective maintenance and the associated costs for same. Per DOE-STD-1073 on CM: "Unique identifiers are important to support equipment and facility operations as well. See DOE O 422.1, *Conduct of Operations [*Component Labeling Attachment 2 Paragraph 2.r] and DOE-STD-1044, *Guide to Good Practices for Equipment and Piping Labeling,* for additional discussion of equipment/component labeling." Where FDAR has authority on this exception, their decision is final.

[5] E.g., by BUILDER asset management system

Number). Terms not MEL-specific are controlled by GLOS-COE-1, Conduct of Engineering Glossary.

abbreviation	An identifier (ID). The short designation used to populate MEL fields, typically a 4- or 6-character-maximum initialism or alphabetism. Formerly called acronym.
CMMS	Computerized maintenance management system that includes the MEL and facilitates work, history-keeping, and other functions.). LANL's CMMS is primarily Asset Suite EAM v9 [AS9] from Hitachi ABB Power Grids and also ABB eSOMS (many TA55 life safety inspections) which in total comprise the MEL. Section 200 concentrates on the MEL in Asset Suite.
component	Part or assembly of parts within a structure, system, or piece of equipment. Components need not be directly connected.
equipment	Assembly of components viewed as a functional entity within a system for providing a specific function within it.
FDAR	Facility Design Authority Representative. Responsible for approving design inputs, implementing design control, approving design outputs, approving design requirements and design configuration, and identifying and maintaining technical baseline documents for a facility or project. Has the primary responsibility of assuring integration of safety and security into the design process. Qualified individuals are designated by the LANL Design Authority (or Site Chief Engineer) for each facility or project. Complete listing of DARs is here.
FOD	Facility Operation Director (or Directorate); responsible for management of a portion of LANL including its maintenance program. Currently, six FODs manage the institution. http://int.lanl.gov/services/facilities/fod.shtml
IDS	Identification string, the system-subtype-sequence number ID string defined by this document and used for numbering and labeling. Formerly called CLI, component location identifier.
item	CMMS can capture both "equipment" and their "components" (albeit somewhat differently); "item" is used herein to refer to both generically. Where appropriate, a MEL equipment item entry can also represent an entire structure (e.g., building shell or civil item) or system.
MEL	Master Equipment List, a subset of CMMS data used for configuration management of items including data for unique identification such as system and key attributes such as safety information.
OSI	OpSystem Identifier: A grouping of MEL Systems, not necessarily functioning together; a required field, aids in locating System choices.
panel	A uniquely identified screen in CMMS (e.g., TIMD030, or simply D030)
SI	System Identifier.
ST	Subtype (lowest level in hierarchy for items, a functional ID often quite specific)
system	Elements (subsystems, equipment, and any components) with physical or notional interconnection and collective purpose.
T	Type (6-character-max category of Subtypes)
TA	Technical Area (e.g., TA-3). All are listed on a tab in Att.1 MEL Upload Workbook.
Unit	TA concatenated with building, e.g., 030410

3.0   IDENTIFICATION STRING (IDS) CONCEPT; KEY DATA FIELDS

A.   A MEL item IDS is composed of the critical data required for item identification.[6] See Figure 200--1 for a depiction of the IDS in its simplest conceptual form and an illustration of how shortened versions may appear outside of the CMMS database.[7] More detail follows in Section 200, appendices, and attachments (e.g., Att. 1 – MEL Upload Workbook's field requirements tab). Existing facility direction and exceptions are discussed in Appendix B.

1.   Caution on drawing object labeling: Showing only Subtype-Seq. No. with each object is only possible if the entire drawing covers no other systems and makes clear the System ID that applies to each object or is otherwise completely clear. Otherwise (and as a good practice), show System ID with each drawing object (i.e., drawing label string reflects full field label string).

Figure 200-1 – Simplified Illustration of IDS Usage

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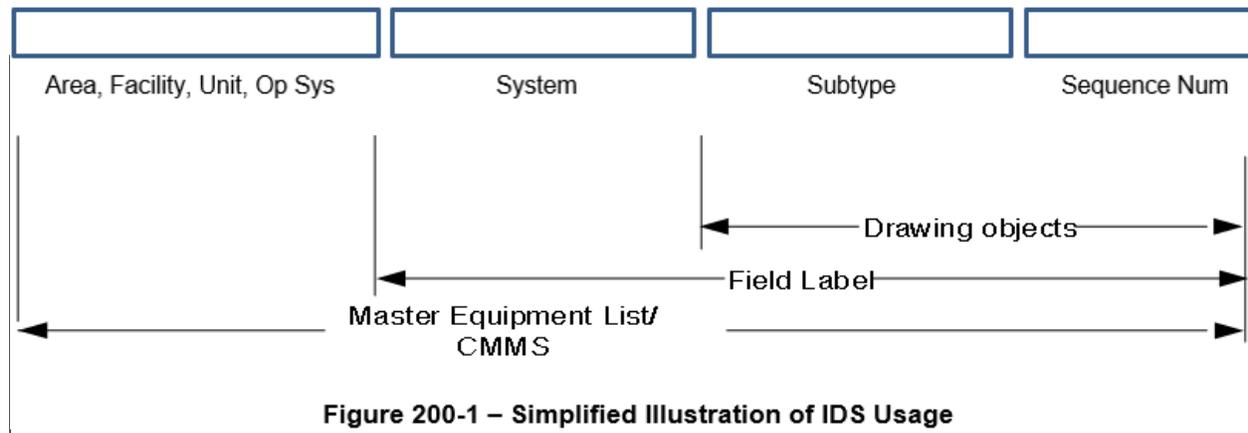
[6] There are other, less-critical but required CMMS fields not shown in this illustration; see Figure 200-2 and App. G.

[7] In CMMS, labwide uniqueness is achieved by the entry of this IDS data along with other required fields, e.g., facility,

unit, op_system, division, area, system, class, equipment_type, equipment_number. Example "PRV-1"; this could be used in many places across LANL; however, one cannot have two PRV-1's in same building, room, and system; CMMS won't accept it.

 As well as being implied by AssetSuite, the IDS concept is suggested by ASHRAE Guideline 4, *Preparation of Operating and Maintenance Documentation for Building Systems*. Also DOE-STD-1073 on CM: "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)." National standards such as IEEE 803.1 (now inactive) also support the concept by standardizing item abbreviations.
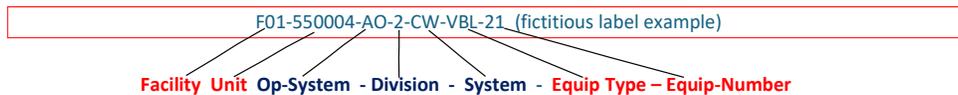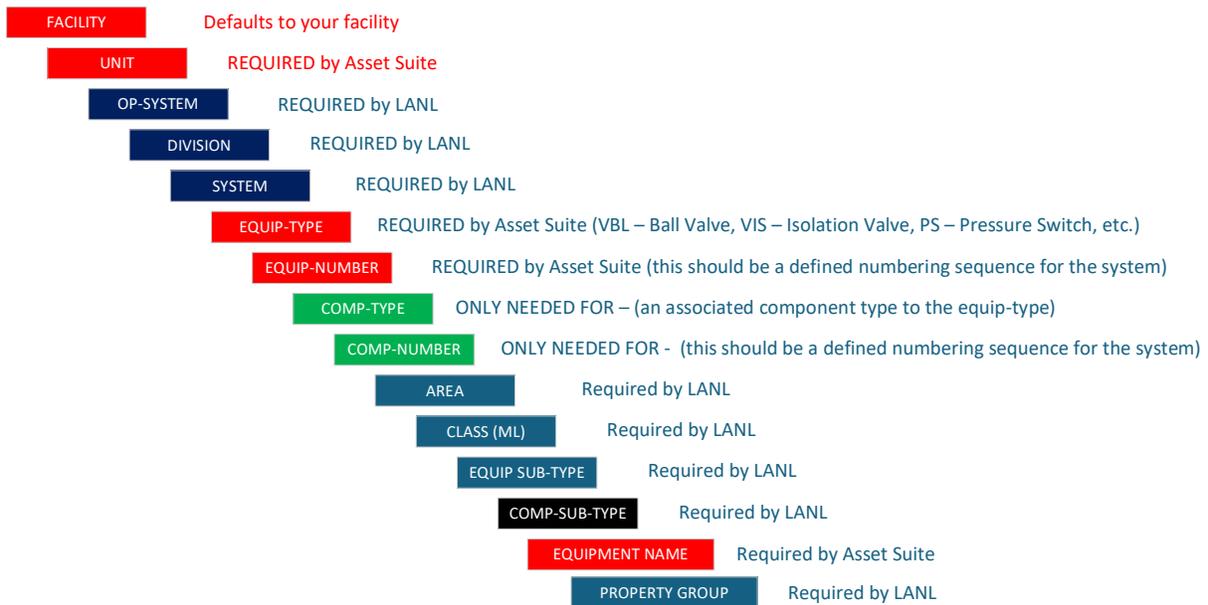
Figure 200-2. Detailed MEL Hierarchy

B.   Brief explanation of Figure 200-1 fields on typical labels (Att. 1–MEL Upload Workbook also address these and others):

1.   SYSTEM - Identifies the system. System boundary setting direction is in Chapter 1 Section 220. System (and also Operating System) names and abbreviations are addressed in App. F herein (listing itself is on the Sec 210 tab of Att. 1 Upload Workbook).

Note: Field tags may use System alone (preferred) or OpSys and System. See Appendix C for exceptions.

2.   EQUIPMENT or COMPONENT TYPE -- A more general category of item, a six-character-maximum alphanumeric ID, addressed in App. F herein (listing itself is on "Sec 230" tab of Upload Workbook). A required MEL field, but normally not on label IDS. Example: VALVE. MEL captures this in the left-hand Equipment (or Component) field (the right-hand, unlabeled field is used to capture the equipment ID).

3.   Equipment and Component Guidance: CMMS supports a hierarchical relationship for items. When there is complex equipment for which associated component tracking is needed, they may be entered as sub records associated with that equipment. Components of equipment should be added to the associated Equipment when information on them warrants capture, including when they need part number capture or separate PMs or history, or have a lower

ML level than the equipment. Components need not be physically connected to the equipment. Examples are: (1) pressure gauge on a pump (equipment is the pump), (2) main drain valve on a sprinkler system (equipment is the alarm check valve), and (3) flow gauge for regenerating air on a desiccant air dryer (equipment is the air dryer). The Section 230 Type and Subtype name/abbreviation choice listings for equipment and their components are identical.

4.   EQUIPMENT or COMPONENT SUBTYPE – Allows for more-specific and useful designation for an item than just Type. Subtype is a four-character-maximum alphanumeric ID. Choices controlled by Sec 230 tab of Upload Workbook. Example: FE for "Fan, Exhaust." Formerly called Functional ID.

5.   SEQUENCE NUMBER: See Appendix A.

4.0   FORMS

- FM01 CMMS Change Approval Form

- FM01 CMMS Change Approval Form Instructions (I)

Chapter POC maintains forms and attachments and is approval authority for changes to same. FM01 is considered a sample, so users may modify or use alternative FDAR-approved methods so long as FM01 approval roles are fulfilled (e.g., signing pdf of worksheet instead, electronic workflows, etc.).

Changes to MEL must be controlled through a process that maintains records of each change and personnel involved.

See also Records heading below.

5.0   ATTACHMENTS[8]

No.	Title	Purpose
1	MEL Upload Workbook	A tabbed Excel file to capture key item attributes for manual or script-based uploads to the CMMS.[9] Sections 210 and 230 system and item abbreviation/name listings are integral to the MEL Upload Workbook (Att 1), replacing listings formerly web-posted as standalone files under those controlling Sections. *Includes tabs with (1) data entry view, Sections 210 and 230 abbreviation and name listings, (2) examples, and (3) listing of CMMS MEL-related field requirements and their usage ("Field Req'ts").*
2	Parameters (Guidance)	A tabbed Excel file of MEL fields called parameters that are available for capturing item data. *Includes tabs with (1) instructions, (2) all available parameter listing, and (3) item-specific parameter lists. Such data should be uploaded where practical; in addition, other documents may require their use in a limited way (e.g., the Workbook above; P101-34 Pressure Safety, P101-41 Oxygen Monitors and Alarms). A few parameter fields exist in Upload worksheets and additional fields may be added — or Att. 2 populated, approved, and used for uploading to MEL.*

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[8] Attachments may be revised independently of Section 200 proper by Standards Mgr approval.

[9] The spreadsheet was formerly Att. 2 to Rev. 8 of this document (and AP-341-404 Att. 1 prior to Sect. 200 Rev. 8 and VAR-10424). Script upload method generally limited to instances with 100's of records.

6.0   APPENDICES[10]

Appendix A. Sequence Number

Appendix B. Existing Facilities

Appendix C. Labeling/Tagging

Appendix D. Label Material, Attachment, and Other Matters

Appendix E. MEL Approval and Upkeep (LANL-only actions)

Appendix F. Sections 210 and 230 Listings – Use and Control

Appendix G. MEL Field Dependencies

Appendix H. Work Order Example (LANL use)

7.0   ASSISTANCE AND TRAINING

For assistance with Section 200, contact the ESM CM/Nomenclature POC or delegate.

Maintenance and Site Services (MSS) has guides that may assist CMMS users. Caution is advised when using the oldest documents (e.g., CMMS-XXX) as they may not be the current approach. The documents are available internally here.

An optional half-day course, *Asset Suite 9 Engineer Module* (UTrain 45150) provides hands-on (live, computer-based) instruction on the Asset Suite 9 system basics as well as focus on functions specific to engineering.

For further assistance with CMMS access or usage, contact cmms-support@lanl.gov (goes to MSS-CMMS team).

8.0   RECORDS

Section 200 generates the following documents and records:

- CMMS Change Approval Form (or approved equivalent method), MEL Upload Worksheet, and/or CMMS Parameters worksheet

Control documents and records per P1020-2, Laboratory Document Control, and P1020-1, Laboratory Records Management.

Note: Because the MEL, and therefore changes thereto, are associated with the technical baseline (ref. heading "References" below), records documenting approvals are required. Paper may be scanned/kept, electronic approvals performed/kept, equivalent software application change processes used, or other FDAR-directed approval mechanism (e.g., DCF closeout documentation). Any method must meet Lab records requirements, and it is the FDAR's responsibility to ensure this for their structures, systems, and components (SSCs). *Note: In discussing "Authenticated Electronic Signatures (aka Digital Signature), GLOS-COE-1, Conduct of Engineering Glossary r1 has the following guidance: "When a pdf file is a QA record, the last signer before transmittal to PSE-IM should click the "Lock document after signing" button in the Acrobat dialog box during signing (this is generally the Authentication step defined below). This is especially true of NQA-1 QA records (see Record definition)."*

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[10] Chapter POC may allow minor variations from appendices in writing.

9.0 REFERENCES

This standard implements requirements of[11]:

A.   LANL SD330, r15, LANL Quality Assurance Program (thus DOE O 414.1D; 10CFR830 Subpart A; and ASME NQA-1),

B.   LANL P950, r10.3, Conduct of Maintenance (thus, for a MEL, DOE O 433.1B Chg 1, Maintenance Management Program for DOE Nuclear Facilities), and

C.   DOE-STD-1073-2016, Configuration Management (thus DOE O 420.1C Chg 3 and DOE 413.3B Chg. 7 for nuclear items).

D.   LANL P341, r7, Facility Engineering Processes Manual (thus the above)

-    In which the MEL is a technical baseline document
-    In AP-341-405, *Identification and Control of Technical Baseline in Operating Facilities*, r6.2 Att. A, MEL used for the instrument index

See also:

E.   DOE G 433.1-1A Chg1, *Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1B* (article III.C, *Master Equipment List*, pg.18-19)

F.   Project Management's AP-350-30X & -40X series procedures on Execution *(e.g., FDAR responsible for MEL update)*

10.0 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 abbreviations used frequently at LANL historically.	Tobin Oruch, *FWO-SEM*	Kurt Beckman, *FWO-SEM*
2	11/18/02	Eliminated unused/hardly used historical abbreviations, 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 abbreviation disciplines are typical, not binding; added/clarified several fire abbreviations.	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.	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	6/16/08	Clarified existing facility use, added CLI term, addressed sequence number reuse, other minor clarifications.	Tobin Oruch, *CENG-OFF*	Kirk Christensen, *CENG-OFF*

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[11] Likely later editions also, but that would have to be verified.

8	1/28/21	Major revision to implement Opsys-Sys-Type-Subtype hierarchy (for MEL realignment to support Builder). Change in title. Creation of appendices covering labeling including material from TA55 desk instruction. VAR-10424 was issued simultaneously to enable new dictionary, upload file, and approval form to supersede those with AP-341-404.	Tobin Oruch, *ES-FE*	Jim Streit, *ES-DO*
9	12/21/21	Fully superseded/canceled AP-341-404 (and VAR-10424) by adding App. E, MEL Approval and Upkeep. Allowed for limited change approval delegation. Introduced upload workbook that included examples, the official abbreviation/name listings discussed by Sections 210 and 230, and field requirements replacing several standalone attachments to Sections 200–230. Other minor changes throughout including oxygen monitor ID requirements.	Tobin Oruch, *ES-FE*	Jason Apperson, *ES-DO*
10	01/31/25	Added MEL to title. In body and App. E, clarified approval methods and recordkeeping by MSS (with other changes, completing LANL-C-2024-2597) In App. D, deleted label request directions. Also in App. E, expanded ML-4 scope for BUILDER, SAFER, and criticality safety needs (last completing LANL-IM-2024-0646-01); refined delegation approach and relaxed for ML-4; refined reconstitution priorities; referenced MSS guides. Previously separate Sections 210 and 230 controlling processes added as App. F, superseding them. App. G on field dependencies added. App. H work order example added. Throughout, acronym became abbreviation; numerous other improvements.	Tobin Oruch, *ES-FE*	Michael Richardson, *ES-DO*

APPENDIX A   SEQUENCE NUMBER

This is an alphanumeric code that ensures a unique identification string for each item. It is joined with the Subtype using a hyphen to form the Equipment (or Component) ID. On the CMMS D030 panel, this is captured in the unlabeled fields to the right of Equipment or Component.

A.   As a minimum, the Sequence Number assignment shall be used to provide uniqueness within a System.[12]

B.   Appendix C, Labeling/Tagging, provides examples of sequence numbers used in the ID of both equipment and components.

C.   *Guidance: Only upper-case alphanumeric characters should be used in the makeup of a Sequence Number. Other characters allowed are the hyphen (-), period (.), and ampersand (&). No other symbols should be used. Non-recommended symbols include the at (@), plus (+), underscore (_), forward and back-slash (/, \ ), single or double quotes (', "), percent (%), brackets ([ ]), parentheses [( )], and en (–) and em (—) dashes; such symbols affect various software programs or scripts and can yield unexpected/unintended results (nevertheless, the @ is used in some subtype abbreviations).*

D.   *Guidance: Sequence number flexibility can be employed in several ways. Ordinarily the Sequence Numbers are assigned beginning with 1, 01, 001, or 0001 (use of zeros is a formatting choice)—or letters (A, B…)—, and typically progress in ascending order (e.g., 1, 2, 3, etc.). Thus, VB-1, VB-2, etc.*

E.   *Guidance: For large systems that run throughout a building, a location identifier can be incorporated into the Sequence Number or elsewhere to ensure uniqueness and aid in locating (see Labeling/Tagging appendices that follow for examples).*

F.   <u>Instrumentation Loop Numbering</u>

    1.   Beyond simply providing a unique item number, added intelligence shall be built into this field for instrumentation, and this approach 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.*

    2.   For loops with multiple items of the same type, add a letter to the item number for each of the duplicate items. *For example, if there are three temperature elements, they would be TE-102A, TE-102B, and TE-102C.*

    3.   *To avoid any duplication of the numbers in the MEL, the sequence number should be followed by a hyphen and the parent item designation if present. For example, a temperature element on HVA-1 could have a sequence number of 102A-HVA-1.*

    4.   *When utilized in a P&ID drawing, the instrument bubbles should contain the Subtype and the first part of the sequence number excluding the system designation, e.g.: TE-102A. Because the P&ID drawings are typically applicable*

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[12] Thus, there can only be one V-1 valve in a system, but an adjacent system could also have a V-1 (and tags have additional, distinguishing information). However, to avoid potential operator valving or other mix-up, facilities may choose to assign valve and instrument numbers from a single, sequential list—e.g., "1" and "101" and other numbers used only once.

> *to only one system, the system designation will be shown in the title block and is not needed in the instrument bubbles.*

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

6.   *The recommended maximum number of characters for the main Sequence Number for instruments is four plus two for alpha subcodes so it fits in the P&ID bubble (e.g., 1002AB). Although not generally recommended, inclusion of System in the bubble may also be expected at some facilities (e.g., TA-55); verify when producing drawings.*

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

G.   Electrical Suffixes. Use as follows:

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

2.   Suffix the Sequence Number based on system voltage as follows (in existing facilities, coordinate the assignment of suffixes with the electrical system engineer)[13]:

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

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

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

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

H.   Other Suffix Guidance. A suffix may also be used as follows:

- Where associative coding is used to associate one or more similar items with a primary item. 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 sub-relays are numbered 001A through 001Z.

- For certain power distribution items, it is allowable to show the alpha abbreviation as well the numerical device function number. For example, an AC circuit breaker Subtype 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. *See App. F, 230 heading, for more on these numerical IDs.*

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[13] This method of designating system voltage has <u>generally</u> been used at LANL for decades (not always consistently).

APPENDIX B   EXISTING FACILITIES

A.   This appendix provides direction on existing item field, drawing, and procedure issues.

    1.   The balance of Section 200 provides content and completeness expectations for new MEL entries, but for existing data, they are a standard toward which to selectively and gradually gravitate and not a directive for a campaign to make all existing data match it[14] or to populate missing data relative to today's expectations.[15] *Such activities would be driven by a facility's FDAR-driven technical baseline reconstitution program or, in the case of the realignment discussed below, an institutional campaign*.

B.   Realignment: The FOD-by-FOD MEL field usage and data realignment that began in 2019 (and described starting with Rev. 8 of Section 200) was a major data disruptor. It resulted in much of the CMMS data reflecting the current conventions shown in Section 200 and requires future data entry to follow same.[16] As such:

    1.   Not an NCR: The realignment resulted in some MEL data not always being identical to all data appearing on existing field labels and in documents (e.g., drawings and procedures). This is not a nonconformance and is generally not considered unsafe or problematic because the MEL and field item are linked by the MEL Equipment-Component Tag field which will sufficiently match (and if it does not, it should be made to match). Also, there is a second tag field in CMMS, the Equipment-Comp **Alt**-Tag field that can and should be used to capture the new (post-realignment) or old tag information.[17]

C.   Modification projects: Because of the potential for confusion this appendix creates on how to label new items for an existing facility, the design agency shall obtain concurrence on IDs from LANL system engineers and include them in the 30% design submittals (e.g., on P&IDs and/or in project equipment list).

D.   System identifier addition to labels for uniqueness: In the field, it may be necessary to add a system identifier to legacy-convention labels to produce unique item identification and labels.[18] Placing it in front of the Subtype (as shown herein) is required except

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[14] Exception — cooperation with MEL Realignment campaign required.

[15] See App. E, Facility MEL Re-development (Tech Baseline Reconstitution) heading.

[16] The main effects of this realignment were, for all items:

- Two-tiered Opsys/System hierarchy imposed

- Two-tiered Type/Subtype hierarchy imposed. Subtype choices largely the previous "Functional ID" abbreviations but shortened to four characters when longer.

- Existing field tag information captured in CMMS.

[17] Tag info appears on work orders and therefore enables maintenance personnel to locate the affected item. The Equip-Comp ID field will generally match the tag as well. Location intelligence may precede or succeed the subtype depending on where captured (e.g., FGF-RM50-1 is in CMMS while RM50-FGF-1 appears on item's tag; see labeling examples appendix).

[18] Where multiple, adjacent systems could have a valve "1" (V-1), having System on tag should prevent mis valving.

where specifically approved by FDAR.[19] Guidance: Labeling is further addressed in Appendix C.

E.   Item Replacement Guidance: When items are replaced with a different model performing the same function (aka Equivalent Replacement), the IDS identification should not be changed.[20] Even a total replacement project might choose to retain the original Equipment ID (reduces CMMS, PMs, drawing, procedure impact).

1.   The MEL record history should indicate the reason the replacement occurred — e.g., failure, upgrade, etc. The new item record should include the new info (make/model/size, etc.) and address what was replaced.

F.   Moving toward Consistency

1.   FDARs desiring approaches not discussed/authorized by this document require this document's POC approval.[21]

2.   General: When multiple numbering and/or labeling conventions are in use in a facility, progression toward this institutional standard is desirable and is the goal.

3.   When field-relabeling an entire system or modifying over 70% of an existing system's items,[22] current LANL standards shall be followed and MEL made to match (*drawings and procedures should be made to match same time*).[23]

4.   If/when most/all of system's tech baseline documents are being updated, follow current ESM nomenclature/approach unless FDAR directs otherwise.

5.   *Guidance on reaching consistency:*

6.   *When modifying a system in a minor way (FDAR judgement on minor):*

a.   If nuclear procedures are NOT affected, THEN it makes more sense to revise field label and document nomenclature for the P&ID.

i.   *If nuclear facility procedures ARE affected, perpetuating existing field label and document reference conventions is generally reasonable.*

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[19] WETF has many items with System appended at the end. This practice may continue for existing systems begun in this manner, and all systems existing and new if desired by FDAR.

[20] Unless the System, Subtype, or other designator is model-specific, or when transitioning to the new (post-Realignment) Type/Subtype schema introduced in Rev. 8 of this document.

[21] This may require FDARs to document approach in a formal way (e.g., desk instruction). Enables POC to refer to document/rev when approving and potentially publicize for design agency awareness.

[22] Fifty percent is a generally accepted threshold for system upgrade to current standards when modifying it; this has a basis in safety and cost effectiveness (ref IEBC Alt Level 3). Item identification relates to safety and cost effectiveness, though arguably less so; thus, 70 percent was chosen. Requirement does not apply in rare cases where a facility was specifically allowed to deviate for unique functional reasons, not merely project inadvertent noncompliance. (E.g., TWF added bldg. no. at the beginning of the IDS per VAR-2015-071 because of similarity of buildings and systems within and potential for mistakes).

[23] Alignment (exact matching) between drawings, MEL, labels, and other numbering usages is always ideal; however, except for the case of system relabeling, it is generally not cost effective to relabel to achieve greater alignment—so long as misalignment is not judged a safety risk by FOD or FDAR. The MEL includes a Tag field that must always match the actual field label; this allows documents to be correlated to field item.

APPENDIX C   LABELING/TAGGING

A.   Item labels and tags shall contain the following minimum IDS data: System, Subtype, and Sequence Number.[24] Additional data is allowed when addressed below or approved FDAR but generally not recommended; see below for approved examples. Exceptions:

   1.   System is not required if space prohibits, it is deemed redundant given Subtype's indication of system (e.g., HVAC-HVA), or it is otherwise not practical or advisable. One such example is small, brass, sequence number-only valve tags on a manifold that is labeled with its system.[25]

   2.   OpSys: Not recommended for labeling as it's only a database need that helps locate Sys but allowed along with or potentially in lieu of Sys (e.g., if Opsys was used in the past and appears on drawings or labels).

B.   Description: Along with the above, tags/labels should also include a concise and meaningful <u>verbal description</u> of the function for the item being identified that correlates with the system and subtype on a separate line from IDS, assuming helpful. Examples: "XXXX Feed Pump" or "Bldg XXX Main Breaker."

C.   Detailed label requirements exist in LANL Master Specifications 22 0554, Identification for Plumbing, HVAC, and Fire Piping and Equipment, 25 0553, Identification for BAS Electrical Systems, and 26 0553, *Identification for Electrical Systems*; also ESM Chapter 7, Electrical; and P315 Conduct of Operations Manual's Att. 18.

   1.   Relevant direction may exist in P101-19, Safety Signs, Labels, and Tags.

   2.   When an item is placed out of service, labeling to this document should remain; however, an "Out of Service" label/tag should be installed.[26]

D.   Identification rules and examples:

   CMMS fields for a hypothetical gas-fired furnace in TA-3-410:

Typical CMMS Field Data (basic/default approach):

FOD	Unit	Opsys	System	Type	Subtype	(Seq. Num.[27])	Eq. ID
F07	030410	HVACR	HVAC	HTR	FGF	1	FGF-1

CMMS Field Data with locational intelligence in Eq. ID's sequence number portion:

FOD	Unit	Opsys	System	Type	Subtype	(Seq. Num)	Eq. ID
Same as above example						RM50-1	FGF-RM50-1

The ID string for above would be HVAC-FGF-RM50-1

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[24] Refer to Figure 200-1 footnote for national standards that support this IDS.

[25] By FDAR approval. Correlation with system and type is not a mandate for identical match, although that's always ideal.

[26] P315-4, *Conduct of Operations Glossary of Terms and Acronyms*, includes Out of Service. The shorthand "OOS" should only be used for logbooks and status boards where users are familiar with   it.

[27] Sequence number is not a CMMS field but appears in Eq. ID and Eq.-Comp Tag fields as a concatenation.

Typical Tag on Furnace (TA/BLDG is optional for most facilities):

03-410
HVAC-FGF-1
East Wing Furnace

Tag with locational intelligence (note how that now <u>precedes</u> Subtype on label):

03-410
HVAC-RM50-FGF-1
East Wing Furnace

HVAC P&ID diagram's furnace symbol label or bubble:

FGF-1

Another equipment CMMS and Tag Field example:

OP. Sys.	System	Equip SubType	Equip ID	Comp. Type	Comp ID	Equip. Tag
HVACR	HVAC	RUA	RUA-3	---	---	HVAC-RUA-3

A component of the above:

		Equip SubType		Comp. Type	Comp ID	Equip. Tag
Same as above example				CDD	CDD-7	HVAC-CDD-7

<u>Equipment-Component association</u>: Including the associated equipment info on a component's label may be helpful. Thus:

Same as above example	HVAC-RUA3-CDD-7

Above, the hyphen normally in the Eq string is eliminated to reduce confusion on syntax when it is used as an association reference in the component tag string (thus RUA-3 becomes RUA3). Adding an Eq association is very similar to the addition of a location reference (described below) and is in that same position on the tag.

E.   Locational Intelligence in Item ID and/or Tag

FDARs sometimes build detailed location-based intelligence into their IDS nomenclature and tagging conventions; this is allowed where described herein and likely to be required for future work there; it may be employed elsewhere with notification to Section 200 POC. The purposes of these variants are (1) to identify where to find something, and (2) in some cases, to make the IDS unique. The "Location ID" is a LANL construct that is not the 3+8+6 character "Location" field in CMMS, nor necessarily the 65-character Location Description CMMS field data, nor necessarily the "Room" or "Area" field data. See below for usage conventions.

Locational Intelligence at TA-55 (FOD 1 and RLUOB)

(Elsewhere with FDAR and POC Concurrence)

Syntax: System - <u>Location ID </u> - Eq/Comp SubType - Sequence Number

Abbreviation	Meaning	Location Usage Example in Item Tag Field
B	basement	B-#, where # is nearest numbered structural basement column
---	building	HVAC-0410-FE-001, HVAC-410-FE-001, or HVAC-PF4-FE-001, where 0410, 410, or PF4 is the building number indication
GB	glovebox	AR-GB123-V-1, where GB123 is used in Equipment field together with Subtype and Sequence Number to identify an argon valve by associated glovebox
XB	transfer box	similar to GB
DB	drop box	similar to GB
RM	room	AR-RM456-V1, where 456 is the room and V1 is first isolation valve from floor penetration
TB	tank bank	AR-TB2-V1, where TB2 is Tank Bank 2
EP	electrical penetration	Legacy usage in PF-4; FP and WP more specific
FP	Floor, roof, or ceiling penetration	AR-FP210-V1
WP	wall (vertical surface) penetration	AR-WP1000-V1

F.   Gas Cylinders versus "House" Gas: Boundaries and Labeling Guidance

When a facility has both "house" gas and standalone cylinders of the same gas:

1.   For cylinders and downstream gas items serving only one system, make them part of the using system and the IDS reflect that. For example, for a nitrogen PCV valve fed by standalone N2 cylinders, the using/owning system is in the beginning of the tag string (normal practice) and the gas abbreviation is included later as part of the sequence number: SOLA-PCV-N2-1.

2.   For gases fed from (and thus belonging to) the house N2 system, the label would lead with that system as normal (e.g., N2-PCV-1).

APPENDIX D LABEL MATERIAL, ATTACHMENT, AND OTHER MATTERS

The FDAR may grant permission to deviation from this appendix.

1.0   LABELS

The Responsible Engineer (RE) is responsible for designating piping, valves, and equipment/components to be labeled and to ensure that labels and fonts are sized appropriately so that they can be easily viewed from a normal viewing distance. The RE is responsible for providing guidance of label placement so that the labels can be easily read without manipulation. *Text size will be dependent on the number of characters and the size of label required.*

Deviations: Deviation from this appendix, including label materials, labeling methods, and pipe markers/arrow tape, may be made with the documented approval of the ESM Ch. 1 POC.

1.1   Label Materials

A.   Labels shall be made from

   1.   material per the LANL ESM and STD-342-200, *LANL Master Specifications*;

   2.   microsurfaced ABS (acrylonitrile butadiene styrene) impact acrylic with engraved letters; or

   3.   metal-coated plastic with engraved letters. Dual-finish Gravostral™ material from Gravotech has been used but other materials may be used.

B.   Temporary labels may be made of paper (additional direction follows later).

1.2   Labeling Method

A.   At the discretion of the RE, labels shall be attached with:

   1.   methods in the LANL ESM and STD-342-200, *LANL Master Specifications*;

   2.   stainless steel beaded chain and couplings/connectors;

   3.   stainless steel swaged wire cable;

   4.   stainless steel or brass jack chain (single or double);

   5.   Kynar cable ties for use in corrosive environments (typically inside gloveboxes) only; cable ties are also known as zip ties, tie wraps, and hose ties; or

   6.   double-sided sticky tape or foam to attach to equipment/component surfaces.

1.3   Pipe Markers/Arrow Tape

Pipe markers/arrow tape may be used following methods in the LANL ESM and STD-342-200, *LANL Master Specifications*.

Other types of pipe markers/arrow tape may be used with the documented approval of the ESM Mechanical POC.

2.0   LABELING REQUIREMENTS

Guidance: Each label should be placed in a highly visible (conspicuous) location so that the person viewing the label does not have to turn it. In addition, the label should not cover existing labels (including etching, paper labels, criticality postings, mass location labels, etc.).

2.1   Pipe Labels

A.   Pipe labeling is required for the following as a minimum:

1.   Safety-class and safety-significant SSCs

2.   Piping systems containing hazardous materials (e.g., acids/bases, poisonous or

3.   suffocating gases)

4.   Systems with pressure above 50 psig, regardless of material contained and including portable systems

B.   Step Description

1.   Follow the color and nomenclature of the ESM Mechanical specifications (e.g., 22 0554, *Identification for Plumbing, HVAC, and Fire Piping and Equipment*) as closely as possible. Discuss variations with the RE.

2.   Use abbreviations controlled by the CAD Standards Manual, Section 300 (App. E-3).

3.   Place the labels at intervals of not more than approximately 20 feet of horizontal or vertical runs; at each branch connection; and where the pipe penetrates walls, ceilings, and floors. Discretion may be used if confusion from more or fewer labels will not result.

4.   Place the labels axially on the pipe (except as noted in Step 4).

   - If flow is unidirectional, place an arrow decal showing the direction of flow by each identification label.

5.   Mark small piping or tubing with a tag at the prescribed intervals where it is not practical to attach a label axially on the pipe or tubing. Use the type of tag provided for valves.

2.2   Valve Labels

A.   The minimum requirements for valve labeling are as follows:

1.   Valves that are required to be in a locked or throttled position, including those located inside a glovebox

2.   Valves that are routinely operated in accordance with an approved procedure, including those located inside a glovebox

B.   The RE is responsible to ensure that valve labels follow the format listed below.

1.   Pressure safety equipment shall also be labeled per ESM Chapter 17 and P101-34.

C.   Step Description

1.   The valve label shall consist of four parts:

   a.   The abbreviation identifying the system

   b.   TA55, RLW, only: The floor penetration number, room number, or a glovebox number (if the valve is associated with a glovebox)

   c.   The letter V, denoting valve (preferred, others as allowed by 230 listing)

d.   A unique number

NOTE: Consult with the RE for an appropriate abbreviation from this standard.

2.   It is preferred that a piping distribution system entering a room starts with the number "1." In these cases, the first valve encountered from the pipe's entry into the room is numbered 1; other valves are numbered sequentially from there. If the first valve entering a room is not numbered 1, the valves should be sequentially numbered with the first valve starting the sequence, if possible/ available.

Where distribution piping branches to service that is associated with a single glovebox, Step 3 applies.

3.   For branches going to specific gloveboxes, valves are numbered from the glovebox to a point where the line combines with other piping, therefore losing its glovebox specificity. It is preferred that these valves are numbered starting with 1 from the glovebox out. Valves on subsequent penetrations should begin at the next available number, with the lowest number closest to the glovebox.

Example:

- A valve in an argon line going into GB-123 (closest valve to the GB) in Room 456 is labeled AR-GB123-V1.

- If a second valve existed in the same pipe between the first valve and the argon supply header, it is labeled AR-GB123-V2.

- If positive-pressure circulating chilled water is also supplied to the same glovebox, the supply isolation valve nearest the glovebox is labeled PPCCWS-GB123-V1.

- The return line isolation valve nearest the glovebox is labeled PPCCWR– GB123-V1 (note the S and R differentiate supply and return).

4.   Other valves in the room not associated with a specific glovebox are labeled as follows at TA55 and RLW:

[System abbreviation]-RM#-V[Sequential #]

Examples:

- The argon supply pipe enters Room 656 and has an isolation valve near the floor penetration. That valve is labeled AR-RM656-V1.

- The next valve in that pipe is labeled AR-RM656-V2, and so on.

- The first positive-pressure, circulating chilled water (PPCCW) supply piping valve, from its entry into the room, is labeled PPCCWS-RM656-V1.

- The first return valve from where the pipe enters the room is labeled PPCCWR-RM656-V1.

2.3   Equipment/Component Labels

A.   The minimum requirements for equipment/component labeling are as follows:

1.   Equipment/components associated with safety class (SC) or safety-significant (SS) systems that would significantly affect the system function of the SC and/or

the SS SSC. Additionally, other facility equipment that should be labeled may be designated by the RE, design engineer, engineering manager, etc. These equipment/components include, but are not limited to, gloveboxes, support stands, pressure transducers, temperature transmitters/elements, flexible hoses (bellows), pumps, pressure indicators, etc.

2. Equipment/components requiring maintenance

3. Pressure safety equipment shall also be labeled per ESM Chapter 17 and P101-34.

B. Step Description

1. Obtain a copy (typically from Design Engineering) of a relevant system drawing (e.g., system equipment drawing, P&ID, etc.).

2. If a relevant drawing does not exist, the RE:

   a. performs a walkdown of the system,

   b. sketches a relevant system drawing, and

   c. assigns current nomenclature/labeling convention (the labeling coordinator may assist with this convention).

3. For large systems, it is appropriate to maintain the legacy labeling format that is currently implemented. The glovebox system is an example of a large system that will maintain the legacy labeling format, examples being:

   a. For Glovebox 859, the legacy labeling format would be GB-859.

   b. Transfer Boxes (XB) and Drop Boxes (DB) will follow suit.

4. Other equipment/components are labeled using the outline in Step 1. Examples:

   - Label the support stand associated with Glovebox 967 with a label that reads:
     – SPRTC-SPRT-GB967

   - The pressure differential indicator associated with GB-1868 would have the label GB-GB1868-PDI1.

   - The pressure control valve on the argon line associated with GB-1769 would have the label AR-GB1769-PCV1.

   - The filter on the argon line associated with OF-1648 would have the label AR-OF1648-FLT1.

   - The flow-indicating control on the compressed air line associated with FH-1550 would have the label CA-FH1550-FIC1.

3.0   LABELING REQUESTS (E.G., EXISTING FACILITY SMALL PROJECTS/NEEDS)

Overseeing labeling for FDAR-managed projects and ongoing operations-phase needs are the responsibility of the FDAR (but not necessarily physical generation or installation). *Temporary labels should be applied if permanent labels cannot be installed promptly; see P315 Conduct of Operations Manual, Att. 18 for further direction.*

APPENDIX E　MEL APPROVALS AND UPKEEP (LANL-ONLY ACTIONS)

1.0　PURPOSE

Provide direction to LANL personnel developing or maintaining a MEL. This replaced similar material in LANL AP-341-404 r2.1 in December 2021.[28]

2.0　APPLICABILITY

This Appendix applies to LANL engineering personnel that develop and maintain MEL data.[29]

The MEL includes, as a minimum:[30]

A.　ML-1 and ML-2 SSCs of hazard category 2 and 3 nuclear facilities and accelerator facilities;

B.　ML-3 SSCs;

C.　SSCs that require preventive or predictive maintenance (PM/PdM), including periodic calibration, testing, and/or inspections for compliance with national codes and standards or LANL policy (e.g., pressure safety, fire protection, life safety, criticality safety);

D.　SSCs that warrant maintenance cost tracking and history of corrective maintenance (CM);[31]

E.　SSCs that use special materials (e.g., special sealing materials, special lubricants, special radiation-resistant materials, etc.);

F.　Custom-engineered equipment[32]; and

G.　Other SSCs identified as required by the FDAR.

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[28] In doing so, Sect. 200 r9 also superseded/canceled VAR-10424 that authorized a partial superseding of AP.

[29] Where FDAR is responsible for programmatic equipment per PD340 (i.e., nuclear safety), this appendix applies; otherwise, programs using the CMMS/MEL for other reasons should institute an appropriate process for capture and approval of their data. Note: Use of the MEL by programmatic groups was increasing rapidly beginning in 2022.

[30] General basis: Implementation of DOE O 420.1C and 433.1B; further guidance in DOE G 433.1-1A (article III.C) and P950 Conduct of Maintenance. Older 433.1 editions were more specific: DOE O 433.1A, Att. 1 CRD para 2.a.1; and DOE G 433.1-1 para 4.4.3.1: "SSCs must include, as a minimum, all safety SSCs and all other facility SSCs requiring maintenance or surveillance or critical to mission objectives or facility operations or desirable for inclusion in the maintenance program for other reasons. Special tools and equipment should be included in this master list."

[31] Repair history and related cost is kept for CM-category work and can be valuable for costly or critical items to inform replacement strategies. For less important items, cost accounting can be done at the building level for minor things, or at a system level if a system is represented in the MEL with a single equipment item of Type=SYSTEM, Subtype=SYS (System of BLDG or more specific). History is not kept for Quick Fix, Minor Maintenance, or Continuous work categories per AP-WORK-001 r13. FDAR has final decision on need for these (ML-4) CM work SSCs.

[32] Unique data may be captured in CMMS proper and/or MEL IDS field data used as metadata in EDRMS record of document(s).

Section 200 – Master Equipment List; Item Numbering and Labeling   Rev. 10, 01/31/2025

Appendix E – MEL Approvals and Upkeep (LANL-only Actions)

Guidance: For projects with hundreds of items, include all SSCs (such as from a project equipment list, typically by bulk upload) in CMMS/MEL.[33] Otherwise, the Section 210 – System List (workbook tab) may be used as further guidance regarding systems in addition to the above that should be considered for inclusion.

Leased items that warrant MEL entry (e.g., for PM or safety reasons) should be included.

3.0   GENERAL

3.1   Instructions

The FDAR owns the facility MEL and assigns an engineer to developing it for a system.

A.   Developing and Maintaining the MEL

The engineer works with maintenance and operations to determine what SSCs will be included, after which the engineer is responsible for developing the MEL for the assigned SSCs (except where delegated per 3.1.2). *Guidance: Projects will normally deliver a project equipment list (PEL) file that is a precursor to a MEL upload file (Ref. TSM, or ESM Ch. 1 Section Z10).*

MSS, determines who the MEL Administrators are, and along with the Facility Engineering Manager, the number required for each FOD.

B.   MEL Item Setup and Change Control

MEL changes may be proposed by anyone.

MEL data/change requires two people minimum, the requestor and the approver. An intermediate reviewer (Verifier) is required when the Approver does not perform this function as well.

Assignment: MEL accuracy (thus change) responsibility rests with the FDAR[34]; however, they may assign change approval authority with the following limitations:

1.   Initial item setups (entries) that affect management level (ML) 1–3 must be FDAR-approved; no assignment allowed. Guidance: When an entire system is ML-4 per a System MLD or other FDAR-approved document, all items within the system are ML-4, so item setup/change need not be FDAR-approved (but FDAR may require it).

2.   For changes to existing entries, the assigned MEL Manager serves the FDAR function. For 1–3 item changes, the assigned MEL Manager must be within engineering. For ML-4 actions, the assigned MEL Manager may be in engineering, the MSS Maintenance Manager for the associated Facility, or in a programmatic organization.[35]

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[33] This facilitates BUILDER asset system population, tracking detailed maintenance history/cost at an item level, and data mining for finding spares, suspect/counterfeit, etc.; set-up is efficiently done at project turnover (e.g., using scripts). The PEL should have them.

[34] While FDAR responsibilities cannot be delegated, the assignment of specific and limited process steps to another is allowed where FDAR ensures the process is being properly followed. While the MEL is generally considered technical baseline, it is arguably of lower importance than most other TB documents in many facilities.

[35] Whether or not delegation occurs, FDARs may designate MEL Manager(s) to provide MEL upkeep oversight and assist with new item data decisions.

a.   Other LANL programs may require engineering approval of MEL change beyond the above (e.g., pressure safety); if so, comply.

b.   FDARs must provide CoE a listing of assignments; *CoE maintains a compilation as an internal webpage reference to Section 200.*

Granularity: MEL Single-entry guidance (sprinkler heads, etc.)

1.   Occasionally, it is best to create a single MEL entry standing for several like items or even an entire system for the purposes of ML documentation and, if applicable, work order creation.

a.   For a whole system, the 230 Type/Subtype list includes SYS to be used for "One entry for all equip in sys" when used in this manner, like some HVAC systems or other things.

b.   When the single entry is for like items, a more specific Subtype than SYS should be used.

2.   Single-entry might be applied to items such as HVAC, fire extinguishers, several fire sprinkler heads in a loop/segment/branch, or other items that are reasonably inspected or maintained as a lot based on a listing or geographical area. The need for separate maintenance history is one factor in deciding if appropriate.

3.   The location description and name should be clear that it is multiple items and, where practical, a listing of items/locations included.

C.   Electrical Item Setup Guidance

1.   Lightning Protection: Aerials are in the MEL by a roof area. (The BUILDER program Unit of Measure is by square feet. Also included are the conductors). Surge arrestors are listed individually if they are stand alone. If in a panel they are considered part of that panel.

2.   Lighting fixtures: There is a separate Type for them.

3.   Wall Switches, receptacles: Do not enter. Low level items of little impact/price typically not listed.

4.   Items of higher importance such as switchboards are given a specific ID and should be in MEL. Same for small but important items like seismic switches, of course.

D.   MEL Change/Setup Process Steps

Step	Responsible Person	Action
1	Requestor	Complete Upload tab of MEL Upload Workbook (Section 200 Att. 1)
		Complete FM01, the currently preferred method for capturing approvals; see FM01(I) instructions file with form. See Records heading in main Section 200.
		Forward proposed changes to the Approver (or intermediate Verifier or other role if local procedure requires such).
		Note 1: *Utilize the MEL change control to change MEL data pertaining to a modification and SSC changes outside a modification (e.g., discovered errors, adding additional data about SSCs, etc.).*

Appendix E – MEL Approvals and Upkeep (LANL-only Actions)

Step	Responsible Person	Action
		Note 2: *For both modifications and maintenance activities, the MEL is required to be updated prior to the equipment being turned over to operations, where the MEL data will become "Active."*
2	Verifier (Approver may perform)	Verify correctness, accuracy, and completeness of the data developed by the Requestor. Iterate with Requestor with any corrections needed. Sign to approve changes. ***Note:*** *Verifier may be anyone who is also knowledgeable of the system for which the MEL is being developed.*
3	Requestor or Verifier	Forward the changes to the Approver.
4	Approver (FDAR or delegate as allowed herein)	As the MEL data owner, review the MEL Worksheet for accuracy and completeness. Sign for data (tool or form). Notify Requestor and/or forward request to MEL Administrator.
5	FDAR or Requestor	Forward approved change(s) to the MEL Administrator
6	MEL Administrator	▪ Enter MEL data into CMMS and sign as complete. ▪ Notify Requestor if their back-checking is desired; make any corrections necessary to match request or its intent. ▪ Complete record-keeping.[36]

4.0 FACILITY MEL RE-DEVELOPMENT (TECH BASELINE RECONSTITUTION)

Core Implementation includes capturing 100% of vital safety systems (VSSs) in hazard category 2 and 3 nuclear facilities, ML-1 and ML-2 SSCs in high and moderate hazard nonnuclear facilities, and ML-1 and ML-2 SSCs in accelerator facilities in MEL.

Mature Implementation is capturing other SSCs that require maintenance in the MEL.

Note: Each FDAR, working with maintenance and operations, should prepare a plan for implementation of this Appendix in their facility. The FDAR will determine when the process of conversion to the new MEL format will commence based on the implementation plan. Apply a graded approach to convert existing MELs. One method may be to update MEL data each month based on systems with scheduled preventive maintenance, updating inactive systems last or not at all. Integrate implementation of this approach with Operations and Maintenance for the facility.

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[36] Documentation must be retrievable from an approved records system; see discussion under "Records" in main Section 200. The default responsibility is the MEL Administrator; this can be others with FDAR approval or accomplished with a software application.

APPENDIX F SECTIONS 210 AND 230 LISTINGS – USE AND CONTROL

Purpose: This Appendix describes the process for use of the Section 210 and 230 tabs of the Section 200 Workbook, and maintenance of same.[37]

NOTE: This appendix replaces and supersedes Sections 210 and 230 which were discrete documents in ESM Chapter 1 from 2001–2024 (prior to integration herein by Section 200 Rev10). Even prior to 2025, their attachments (name/abbreviation listings) were integrated into the Section 200 Att. 1 workbook (in late 2021).

WARNING: Names and abbreviations other than those on Section 210 and 230 tabs may only be created and used by permission of the Chapter 1 Component Number/Labeling POC or their designates (listed on the POC/Tech Committee page above). Requests for addition to — or modification of — the listing shall be directed to same, who can grant approval for interim use until listing is revised.

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210 OPERATING SYSTEM (OPSYS, OSI) AND SYSTEM (SI) LIST

1.0   GENERAL

A.   Systems are elements (subsystems, equipment, components) with physical or notional interconnection and collective purpose.

B.   For requirements on system boundary setting, see Chapter 1 Section 220.

- VFDs and CDDs belong to the System they power

- Gas cylinders/bottles supplying specific equipment are part of the equipment's OSI and SI; e.g., an N2 cylinder and its associated PRV supplying an analyzer would have the same OSI and SI as the analyzer. *See also App. E heading, 'Gas Cylinders versus "House" Gas: Boundaries and Labeling Guidance.'*

2.0   GUIDANCE

A.   These designators (abbreviations) are also used within CoE document numbering (ref. AP-341-402) and thus by EDRMS, and by various Conduct of Engineering processes (e.g., Variance Form 2176).

B.   The list POC should attempt to keep the Opsys and Sys list abbreviations unique from each other to minimize possible confusion.

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[37] Listing revisions do not require the Engineering Standards Board's meeting or QA or independent technical review prior to approval by CoE as they are fundamentally non-technical.

230 TYPES AND SUBTYPES (T&ST) FOR ITEMS

1.0   GENERAL

A.   Should this listing and other Standards documents (e.g., CAD Standards Manual P&ID symbols) conflict, this listing generally governs (Exceptions: Abbreviations for some drawing objects and pipe line labels differ; see CAD Standards Manual, Section 300 (e.g., App. E-3 and others).

2.0   LISTING USAGE GUIDANCE

A.   Columnar guidance

    1.   Subtype column. See "More on Subtypes" below.

    2.   Subtype Name column

B.   Where the official Subtype name exceeds 30 characters, the complete name will be in the Notes field at the top of any info. The text color should be blue.

C.   How 230 is maintained:

    1.   Consideration of current usage of abbreviations

    2.   Standards on which listings are often based:

- ASME Y14.38, Abbreviations and Acronyms for Use on Drawings and Related Documents

- ASPE – Am Soc Plumbing Engrs *Data Book Ch 21*

- IEEE 803.1-92, Recommended Practice for Unique Identification in Power Plants and Related Facilities - Component Function Identifiers [used despite being withdrawn]

- IEEE 1015, *IEEE Recommended Practice for Applying Low-Voltage Circuit Breakers Used in Industrial and Commercial Power Systems (Blue Book)*

- IEEE 1100, Recommended Practice for Powering and Grounding Electronic Equipment (Emerald Book)

- ISA 5.1, Instrumentation Symbols and Identification (reaffirmation of ISA S5.1)[38]

- NECA 100, Symbols for Electrical Construction Drawings

- NFPA 170, Standard for Fire Safety Symbols

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[38] ISA 5.1 (as slightly augmented by this document) is required for nuclear projects subject to DOE O 420.1C, Facility Safety.

History: The process to produce the Type-Subtype listings was (and to some extent still is, albeit with newer editions):

Around 2002, a comprehensive listing of items was produced from national standards, CMMS data, D. T. Bush memo FSS-9/MM-95-048, and the 1999 LANL drafting and engineering standards manuals. This was then thinned to include the most used and expected components. Historically used IDs in widespread use were retained. This was augmented by IEEE 803.1.

- For mechanical, ASME was used to augment 803.1; NFPA and NECA provided fire-related IDs in rare instances. ASPE Data Book Ch 21 provided some plumbing acronyms.

   o   ASHRAE Guideline 4-2008, *Preparation of Operating and Maintenance Documentation for Building Systems*, which has suggested HVAC-R acronyms, was reviewed but not utilized.

- For instruments, if 803.1 referenced ISA, then ISA was listed as the source.

   o   In a few rare cases, it was necessary to modify national acronyms where the source documents were non-unique from one to the next (e.g., the instrument "Final Element, Flow" was designated FE@ [with its basis sometimes noted as "5.1mod"] to distinguish it from "Fan, Exhaust" which is commonly designated "FE" at LANL).

- For electrical/I&C, when 803.1 did not provide sufficient granularity or did not list a component, it was augmented by ISA, NECA, or IEEE 1100.

   o   IEEE C37.2-2008, *Standard Electrical Power System Device Function Numbers and Contact Designations,* was reviewed and found to duplicate the device numbers in IEEE 803.1; likewise, an informative listing in Annex E of NFPA 79-2018, *Electrical Standards for Industrial Machinery,* was reviewed but not utilized.

   o   The IEEE/ANSI C37.2 "standard electrical power device function numbers" shown in 803.1 are most used in conjunction with utility-type transmission and distribution equipment and sometimes in one-line diagrams for low voltage utilization level switchgear. These numbers are rarely seen in conjunction with NEMA switchboards, panelboards, or motor control centers. It is not necessarily wrong to use them in conjunction with NEMA-grade equipment, just unusual and cumbersome.

   Where they are used, power device function numbers must be use strictly in accordance with IEEE Std C37.2. In that document, a device **52** is a circuit breaker, but the trip unit is usually represented by a **51**, **51G**, **51/50,** or **51G/50G** device function number, the **51** indicating an AC time overcurrent relay function (long time and short time), the **50** indicating an instantaneous overcurrent relay function, and **G** indicating ground fault overcurrent relay function (if present).

   This kind of representation is fine for low-voltage switchgear in which the power circuit breakers have identifiable electronic trip units—one can think of the trip unit as a "relay." But to this approach breaks down for equipment employing molded case circuit breakers that do not have identifiable trip units.

   IEEE Std C37.2 defines the 89 "line switch" as "A switch used as a disconnecting, load interrupter, or isolating switch in an AC or DC power circuit. (This device function number is normally not necessary unless the switch is electrically operated or has electrical accessories such as an auxiliary switch, a magnetic lock, etc.)" It appears that the proposed use of 89 is OK used as MV disconnecting, load interrupter, or isolating switches. CDD should be used for low-voltage systems.

APPENDIX G CMMS HIERARCHY AND FIELD DEPENDENCIES

This appendix addresses how the CMMS tool associates and constrains data. Most users will not need to understand or refer to it. It is here to help super-users and chapter maintainers support others.

Note: The CMMS tool's hierarchy is different from (but does not countermand) the expected, more complete and useful MEL data hierarchy (e.g., Figure 200-2) and labeling requirements approach described elsewhere in Section 200.

Below is a pictorial overview of the CMMS schema.
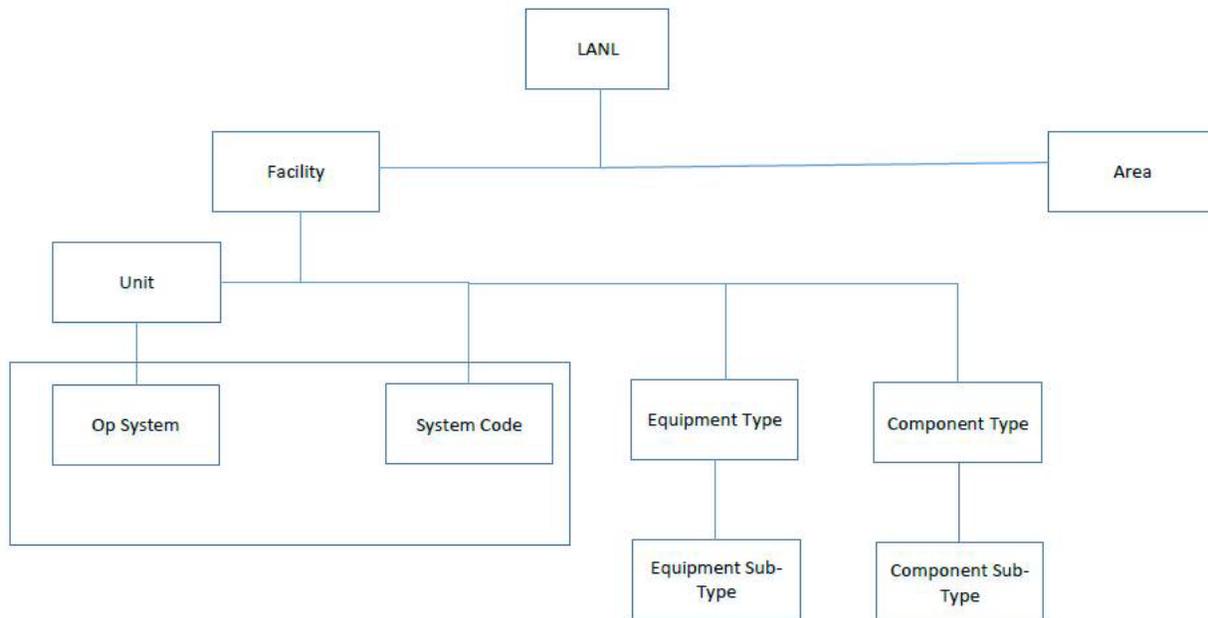
Figure 200-G-1 – CMMS Field Hierarchy and Positional Qualification of Data

The following table also indicates how the CMMS limits data entry based on the CMMS hierarchy and other program limitations and settings.

Fields shaded green are part of the CMMS application's hierarchy and thus there cannot be two records with identical data in all of them, as that would create duplicate records. Yellow rows are field "names" that MEL input worksheet users will not see but they appear on 210/230 listing tabs to aid choosing best abbreviation.

Field Name	Max Characters	Notes
E_CODE	10	System generated; don't alter
FAC	3	Facility; don't alter
UNIT	6	Building/OSF; don't alter
OP_SYS	6	Qualified by FAC and UNIT
N Op Sys	6	
Op Sys Name	65	

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Field Name	Max Characters	Notes
SYS	6	Qualified by FAC
N Sys	6	
System Name	30	
EQ_TYPE	6	Qualified by FAC
N Eq Type	6	
Type Name	30	
EQ_SUBTYPE	4	Qualified by FAC and EQ_TYPE
N Eq Subtype	4	
Subtype Name	30	
COMP_TYPE	6	Same source as EQ_TYPE
N Comp Type	6	
COMP_SUBTYPE	4	Same source as EQ_SUB_TYPE
N Comp Subtype	4	
EQ_NUM	15	
COMP_NUM	15	
EQ_COMP_TAG	30	
EQ_NAME	65	
STATUS	8	
PROP	4	
DIV	20	Room number
AREA	8	
LOCATION	65	
ML	8	

APPENDIX H WORK ORDER EXAMPLE (LANL USE)

Note on MSS work execution and data completeness: While the expectation for new records is every field required by Att. 1 being filled, some existing records are nevertheless incomplete or contain errors (e.g., OpSystem or other data). Should this be the case for a given work order, from a Section 200 (and safety) standpoint, this is not a reason the work order cannot be executed if the item can be positively identified from the data present (e.g., System and Equipment or Component data) and truly necessary data (e.g., ML) is present.

Excerpt of an Example of a CMMS Work Order showing fields included follows.