Los Alamos NATIONAL LABORATORY EST. 1943

Conduct of Engineering
Request for Variance or Alternate Method

Assigned by SMPO or SMPOR: ☒ Alternate Method ☐ Variance Tracking number VAR-16-009 r1

1.0 Affected Document(s)

☐ Engineering Processes (e.g., P 341) ☐ Engineering Standards (e.g., P 342) ☐ Engineering Training & Qualification (e.g., P 343) If against P documents themselves, revision: N/A	Subordinate (Functional Series) document if applicable (ESM Chapter, Master Spec, AP, etc.): Document Title/Number: ESM Chapter 16, Section IBC-GEN (primarily) Revision: 9

Section/Para

1. IBC-GEN Figure 1, IBC Program Three-Tiered Admin Approach Flowchart
2. IBC-GEN 3.0.C regarding Annual Permit
3. IBC-GEN Table IBC-GEN-3 Flowchart Summary
4. IBC-GEN FM01 Preliminary Project Determination form
5. Any other Ch. 16 references to 3-tiered approach, annual permits, and when Form 1 is used.

Specific Requirement(s) as Written in the Document(s)
Various statements regarding the use of the 3-tiered graded approach, annual permits, and when Form 1 is used.

2.0 Request

Brief descriptive title:
IBC Program Graded Approach Streamlining

NCR required (work has occurred)? ☐ Yes ☒ No	If Yes, NCR Number
TA-Bldg-(Room) and/or Project Affected N/A	System/Component Affected N/A

Proposal

Follow Attachment 1 matrix showing new graded approach replacing current 3-tiered graded approach flowchart. In summary:

In lieu of the current graded approach to administrative control of alterations, allow certain lower-risk IEBC Level 2 alterations not affecting life safety or egress (dubbed 2A) to be permitted by the Facility Design Authority Representative (FDAR).

For this subset, eliminate (1) the need for core (downtown) review/approval of LANL Building Official (LBO) package, (2) certain lower risk inspections, and (3) certificate of occupancy process.

Revision 1: Further amends Form 1 to add SharePoint filing instructions. Minor clarifications on Attachment 1 matrix. For FDAR-permitted projects, they must sign for LBO on SSIs (and elsewhere where required).

Justification/Compensatory Measures

1. Preliminary Project Determination forms must be completed and signed by FDAR for all IBC tasks (now including repairs) and maintained in a central SharePoint subject to audit (nominally annually). A revised form reflecting the new process is included as Attachment 2, and will be webposted as FM01, r4 within 2 working days of VAR issuance.
2. Personnel listed as IBC SMEs on the webposted listing maintained by the ES-EPD Group Leader must review designs before issuance (no change from before).
3. Special inspections by CM-CE shall be performed whenever required by IBC Ch. 17 (essentially unchanged, except FDAR signs SSI for LBO when performing permitting).
4. Level 2 alterations involving life safety and/or egress (dubbed 2B) and higher-risk proposals (Level 3 alteration, change of occupancy, addition, new building, and relocation) must be reviewed by ES-EPD core team (strengthening).
5. Because the previous (IBC-GEN r9) graded approach was woven into a number of documents/places that may not have been addressed by this alternate method, the Chapter POC shall be contacted for assistance in adapting them to new approach (and subsequent revision as appropriate).

Duration of Request:	Start Date: December 2, 2015	End Date: Until superseded by IBC-GEN revision, or upon cancellation.	☐ Lifetime

Requestor Tobin Oruch	Z Number 120812	Organization CENG	Signature signature on file	Date 12/22/15
USQD/USID required (Nucl. High/Mod Hazard)? ☐ Yes ☒ No		If Yes, USQD/USID Number N/A		
Design Authority Representative See SMPO below	Z Number	Organization	Signature	Date
LANL Owning Manager (FOD or Programmatic) See SMPO below	Z Number	Organization	Signature	Date

3.0 Safety Management Program Owner (SMPO) Representative (SMPOR/POC)

☐ Decline ☐ Accept ☒ Accept Labwide ☐ with Modification:			
POC Tobin Oruch	Z Number 120812	Signature	Date

4.0 Additional Approval for P341 and APs; P342, ESM, Code, and Regulation Matters; and P343

☒ Accepted ☐ Accepted with comments ☐ Declined			
Comments:			
Safety or Security Management Program Owner Lawrence K. Goen	Z Number 106351	Signature signature on file	Date 12/22/2015

VAR 16-009 Attachment 1 (rev 1)

IBC Program Streamlined Graded Approach (replacing GEN Fig. 1 flowchart, Table GEN-3, etc.)

Work Type / Requirements	Test & Insp Plan	Design Review[1]	Permit	Inspection/Test[2]	Cert. of Occupancy
Lowest Risk	**IEBC Repair or replacement in kind** (Level 1 Alteration = removal and replacement or covering of existing elements, equipment, or fixtures using new ones that serve the same purpose)	Optional[3]	IBC-List SMEs	FDAR[4]	CM-CE when code (e.g., NEC, fire, B31 piping, SSI tasks); LANL performing org otherwise	n/a
Moderate Risk	**Level 2A Alteration**: System reconfiguration, extension, additional equipment installation, or removal (except when 2B below)	Required when CM-CE is inspecting	IBC-List SMEs	FDAR[5]	CM-CE when code (e.g., NEC, fire, B31 piping, SSI tasks); LANL performing org otherwise	n/a
Highest Risk	**Level 2B Alteration. Same as 2A but has**: • Possible egress aspects (workspace reconfiguration or door or window addition or elimination) and/or • Life safety or related systems affected **—or—** **Level 3 Alteration or above**: 1. New building, relocation, change of occupancy, or expansion/addition, 2. Work area exceeds 50 percent of the aggregate area of the building, and/or 3. Complex reroofing (parapet bracing, overlays, changing from low slope to steep slope or adding a ballast. 4. Structural demolition (see IBC-GEN article on this)	Required	EPD Core IBC SMEs + FP-DO	LBO	CM-CE	LBO

CONSTANTS WITH THE ABOVE

1. **PPD**: Preliminary Project Determination Form (IBC-GEN FM01) must be completed for EVERY IBC Program job and approved by FDAR. Key determinations from PPD must be captured in design inputs and outputs (ideally drawing title sheet). PPD forms and other records of FDAR actions must be filed in ES-DO SharePoint and will be assessed by LBO (nominally January for previous CY).
2. **SSI**: When required by IBC 1704.3, Statement of Special Inspections per IBC-IP and its Att B must be developed/used. For FDAR-permitted tasks, FDAR signs in LBO stamp field.

[1] This Ch. 16-webposted SME listing is maintained by EPD Group Leader.
[2] NEC=National Electric Code; fire=Int'l Fire Code and NFPA 101 and 221 (fire barriers); B31 piping=ASME B31.X (not UPC/UMC); SSI tasks include firestopping/firecoating in hi-rise or Risk Category 3 & 4 buildings; anchorage that's not seismically exempt per ESM Ch. 5 Section II Att A; structural concrete, steel, soils, etc. per IBC 1704.3. Besides these, inspections per IBC Sect. 110 may be performed by non-CM-CE LANL personnel for IBC Program purposes (including for crafts, if allowed by CM procedures) due to LANL's trained craft/techs and supervision.
[3] Formal TIP or VIT per IBC-IP Att H not required, but must perform code- and spec-required inspections/tests per that column.
[4] FDAR PPD Forms/log and control of change meets IBC annual permit control needs (no LBO stamp).
[5] FDAR signature on Level 2A design indicates permitting approval (no LBO stamp). 2A/2B split is LANL-specific for admin purposes and not present in IEBC.

Preliminary Project Determinations

Requestor Input

Complete 1-8 for all tasks.

1. Document ID Number: PPD- *Obtain PPD number from ENG Document Numbering utility (on AP SharePoint site)*
2. Task/Project Name/Location:
3. Estimated cost of work:
4. Statement of Work and proposed IEBC Ch. 4 Work Classification(s) – by subtasks if differing: *Describe the proposed work with sufficient detail to allow proper classification per the choices given below. Subtasks may have different classifications (e.g., may be altering one system as Level 1 and another as Level 2). For IEBC Alt Level 2 and 3 adding additional loads on seismic-force-resisting SSCs, include enough detail that a judgment can be made on need for a feasibility study, or arrange for study prior to submission of this form.*[1] *Classifications: Repair, Alteration Level 1, Alt Level 2A, Alt Level 2B, Alt Level 3, Use or Occupancy Change, Addition, Historic, Relocation, Demolition, and/or New Building.*
5. Does work involve any special inspection tasks such as: ❒N/A Structural anchorage, concrete, steel, or masonry? ❒ EIFS (synthetic stucco)? ❒ Fire coatings or fire barrier penetrations in hi-rise or Risk Category 3 & 4 buildings? ❒ Other IBC Ch. 17 task? ❒ (if so, Statement of Special Inspections required by IBC 1704.3)
6. If self-perform, spec submittal reduction eligibility potential per ESM Ch. 1 Section Z10 Att. F criteria? ❒Yes ❒No ❒N/A
7. Eligible for sketches only (vs. drawings) per CAD Standards Manual? ❒Yes ❒No ❒N/A
8. Other information helpful to determinations to be made:

If IEBC Ch. 4 Work Classification (field 4 above) is solely Repair, then fields 9-19 need not be completed.

9. Risk level per IBC-GEN Figure 1, IBC Program Three-Tiered Approach Flowchart: ❒Highest ❒Moderate ❒Lowest
10. Hazardous materials in occupancy (if yes, describe existing inventory and effect of project, or refer to and attach Form 2, HazMat Determination/Chemical Inventory)
11. Proposed IBC Ch. 3 Use and Occupancy Class(es) with rationale (N/A unless potentially changing from design basis or current levels):
12. Key requirements triggered -- accessibility per IEBC, lateral bracing per IBC 1613.1, R&D equipment anchorage, seismic retrofit per ICSSC RP 8, etc.):
13. Existing facility mods: Qualifies for code of record design per criteria in IBC-GEN Att. B, LANL Existing Building Code ❒Yes ❒No ❒N/A If yes, COR date: _____
14. For Alt Level 2 and 3 adding additional loads on seismic-force-resisting SSCs, must a feasibility study be performed? ❒Yes ❒No
15. NPH: PC, RC, or NDC/LS category (see instructions for guidance):
16. Sustainable design review required to ensure meets ESM Ch. 14? ❒Yes ❒No
17. Commissioning required per ESM Ch. 15? ❒Yes ❒No
18. Existing nuclear facility “major modification” ❒Yes ❒No ❒N/A
19. Optional Comments/Determinations (e.g., key requirements triggered -- accessibility per IEBC, lateral bracing per IBC 1613.1, R&D equipment anchorage, seismic retrofit per ESM Ch 5/ICSSC RP 8, etc.):

Requester		Z Number	Organization	Date
Email	Phone		Code of Record date or intended IBC/IEBC Edition	

FDAR Action

❒Accept ❒ Accept with Modification:			
Name	Z Number	Signature	Date

[1] For demand/capacity ratio, there’s a 10%-latitude-exception for lateral-force-resisting systems with the 10% latitude to be considered cumulatively over the life of the building; see IEBC-2015 807.5 Exception last sentence.

Instructions, Definitions, and Guidance on PC/RC/NDC Categories

(do not print with form; not part of QA/EDMS record)

Instructions

IBC work (ESM calls all work "projects") must receive preliminary determination from the Facility Design Authority Representative (FDAR):

A. IBC/IEBC scope: First, determine whether proposed work is subject to LANL's program within the rules and examples in Tables IBC-GEN-1 & 2.

1. If FDAR determines not in IBC Program, no documentation is required; project may exit this process/chapter
2. If the FDAR has any uncertainty regarding this decision, they must consult the Chapter 16 POC

B. If in scope, work classification(s) based on this form's definitions in its instructions. E.g., Repair, Alteration Level 1, Alt Level 2A, Alt Level 2B, Alt Level 3, Use or Occupancy Change, Addition, Historic, Relocation, Demolition, and/or New Building.

C. Once issued, these determinations must then be included as **preliminary** design inputs somewhere in the statement of work for the design, noting that the design agency retains responsibility for proposing more appropriate classifications as soon as they become evident.

D. Completed forms are QA records. A copy of the form should be kept in the project/task file. The record copy shall be kept as follows:

1. Use the SharePoint sites for the FODs (e.g., ES-55, ES-EWMO, ES-LFO, ES-STO, ES-UI, and ES-WFO). In each of the sites there is a library named "Preliminary Project Determination".
2. Obtain a Preliminary Project Determination (PPD) document number from the CoE site.
3. Prepare the PPD in Microsoft Word.
4. It is preferred that the Word file is converted to PDF and signed electronically. Alternatively, print the form, get manual signatures and scan to a PDF file.
5. Use the document number for the word and PDF file names: PPD-TA-BLDG-XXXX.docx and PPD-TA-BLDG-XXXX.pdf.
6. Upload both files to the Preliminary Project Determination library for your organization.
7. Fill in the first 8 fields of attributes in the SP library: Type (filled automatically), Title, Name (filled automatically), Facility Name, Functional Organization, Doc Revision, and Date on Document.

These SharePoint sites are part of the ES-DO site collection. To find the site, go to "ES Division Shared Information" site listed under the "SharePoint Site" heading under Resources on the ES Division Home Page. The FOD sites for which a user has access will appear on the navigation list across the top. If you need access, contact POC(s) shown on the website.

E. Change Control: In addition to designer proposals noted above, Requester must submit a revised form if the scope increases or life safety improvements are descoped, or stated use changes. Requester should submit a revised form if scope or use otherwise decreases such that classification(s) may have gone down. Revised determinations may also be made by LANL during design review as "C" comments (with a basis).

F. Final determinations are documented by the final, permitted design.

Definitions

Repair

Definition: The restoration to good or sound condition of any part of an existing building for the purpose of its maintenance. Repair includes the patching or restoration or replacement of damaged materials, elements, equipment or fixtures for the purpose of maintaining such components in good or sound condition with respect to existing loads or performance requirements. Limited to work on the item and does not include complete or substantial replacement (a majority of the original remains) or other new work. Repairs shall not include the cutting away of any wall, partition, or portion thereof, the removal or cutting of any structural beam or load-bearing support, or the removal or change of any required means of egress or rearrangement of parts of a structure affecting the egress requirements; nor shall ordinary repairs include addition to, alteration of, replacement, or relocation of any standpipe, water supply, sewer, drainage, drain leader, gas, soil, waste, vent, or similar piping, electric wiring, or mechanical or other work affecting public health or general safety. Must follow IEBC Ch. 6.

Work on non-damaged components that is necessary for the required repair of damaged components shall be considered

part of the repair and shall generally not be subject to the other classification requirements (must describe in SOW; subject to LBO concurrence).

Level 1 alterations include the removal and replacement or the covering of existing materials, elements, equipment, or fixtures using new materials, elements, equipment, or fixtures that serve the same purpose. Must follow IEBC Ch. 7.

Level 2A alterations: System reconfiguration, extension, additional equipment installation, or removal (except when 2B below). **Level 2B** includes possible egress aspects (workspace reconfiguration or door or window addition or elimination) and/or life safety or related systems affected. Must follow IEBC Ch. 7 and 8.

Level 3 alterations apply when a major building renovation or reconfiguration work area exceeds 50 percent of the aggregate area of the building. Must follow IEBC Ch. 7-9.

> **Work Area.** That portion or portions of a building consisting of all altered spaces as indicated on the construction documents. Work area excludes other portions of the building where incidental work entailed by the intended work must be performed and portions of the building where work not initially intended by the owner is specifically required by code. Applies to altered spaces, not systems.

Change of Occupancy. A change in the use of the building or a portion of a building. A change of occupancy shall include any change of occupancy classification, any change from one group to another group within an occupancy classification or any change in use within a group for a specific occupancy classification. . E.g., adding people or hazardous chemicals must be analyzed for impact. Must follow IEBC Ch.10.

Addition. An extension or increase in floor area, number of stories, or height of a building or structure. Must follow IEBC Ch.11.

Historic Building. (at time of writing, LANL has a few at or near V-Site). Any building or structure that is listed in the State or National Register of Historic Places (ROHP); designated as a historic property under local or state designation law or survey; certified as a contributing resource within a National Register listed or locally designated historic district; or with an opinion or certification that the property is eligible to be listed on the National or State ROHP either individually or as a contributing building to a historic district by the State Historic Preservation Officer or the Keeper of the National ROHP. Must follow IEBC Ch.12.

Relocated buildings provisions shall apply to relocated or moved buildings, including trailers.

Technically Infeasible. An *alteration* of a building or a facility that has little likelihood of being accomplished because the existing structural conditions require the removal or *alteration* of a load-bearing member that is an essential part of the structural frame or because other existing physical or site constraints prohibit modification or *addition* of elements, spaces, or features that are in full and strict compliance with the minimum requirements for new construction and that are necessary to provide accessibility.

Major mod: Change to a nuclear facility that substantially changes the existing safety basis [adaptation of DOE-STD-1189-2008]. Determination is made through a checklist (see SBP114-1, *Safety Basis Development for Projects, Att 2).* Major mods must meet DOE O 420.1C. Other mods may qualify for code of record design per ESM Ch 1 Section Z10 and IBC-GEN Att B (LEBC).

NOTE: In addition to work triggered by IEBC categories, the Int'l **Energy Conservation** Code mandates envelope upgrades at times (e.g., change of occupancy, conditioning unconditioned space), as does IEBC Ch 4. See IECC C501 and ESM Ch. 14.

Determining PC category of a building (not system or component) from FIMS (Guidance)

1. Go to http://int.lanl.gov/services/facilities/fims.shtml
2. Click on ARCHIBUS in lower right, then ARCHIBUS Web Central, then Space Inventory & Performance, then LANL FIMS, then FIMS Common Data Elements.
3. Type TA-BLDG No (i.e., _ _ - _ _ _ _) under Structure Code, & then click Filter.
4. Move the scroll bar approx. ¾ of the way across the screen, until you see/read Seismic Essential.
5. You will see P_ (e.g., P1, P2, etc.) under Seismic Essential, which means the building structure is PC-_ (i.e., whatever the number is following "P").

NOTES:

1. The Performance Category (PC) of the building structure is not necessarily the same as the PC of the systems & components inside of it.
   - What appears in FIMS is JUST the PC for a given structure.
   - CMMS Screen D031 may have equipment PC data (field: "Seismic"). If not, ESM Chapter 5 Section I details how to determine SDCs for structures, systems & components (SSCs).
2. FIMS had not been modified to capture new RC/NDC terminology vice PC at time of writing.
3. ESM Chapter 5 Section I includes crosswalks from PC-to-RC or NDC. Consult with FDAR to resolve any NPH determination issues.