



**Conduct of Engineering
Request for Variance or Alternate Method**

Assigned by SMPO or SMPOR: Alternate Method Variance

Tracking number VAR-16-009

1.0 Affected Document(s)

<input type="checkbox"/> Engineering Processes (e.g., P 341) <input type="checkbox"/> Engineering Standards (e.g., P 342) <input type="checkbox"/> Engineering Training & Qualification (e.g., P 343) If against P documents themselves, revision: <u>N/A</u>	Subordinate (Functional Series) document if applicable (ESM Chapter, Master Spec, AP, etc.): Document Title/Number: <u>ESM Chapter 16, Section IBC-GEN (primarily)</u> 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 a 3-tiered graded approach (H, M, L), annual permits, and when Form 1 is used.	

2.0 Request

Brief descriptive title: IBC Program Graded Approach Streamlining				
NCR required (work has occurred)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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 vice current Highest-Moderate-Lowest flowchart. In summary: In lieu of the current graded approach to administrative of alterations, allow certain lower-risk IEBC Level 2 alterations (dubbed "2A", and not affecting life safety or egress) to be permitted by the Facility Design Authority Representative (FDAR). For this subset, eliminate (1) the need for core (downtown) Preliminary Project Determination form and LANL Building Official (LBO) package permit review/approval/stamping, (2) certain lower risk inspections, and (3) certificate of occupancy process.				
Justification/Compensatory Measures 1. Preliminary Project Determination forms must be completed and signed by FDAR for all IBC tasks (now including repairs) and now maintained as records subject to audit (nominally annually). A redlined form reflecting the new process is included as Attachment 2, and the final form will be webposted as FM01, r3 within 2 working days. 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) 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, 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 in detail 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.	<input type="checkbox"/> Lifetime
Requestor Tobin Oruch	Z Number 120812	Organization CENG	Signature electronic signature on file	Date 12/01/15

USQD/USID required (Nucl. High/Mod Hazard)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		If Yes, USQD/USID Number N/A		
Design Authority Representative See SMPO below	Z Number	Organization	Signature	Date
LANL Owing Manager (FOD or Programmatic) See SMPO below	Z Number	Organization	Signature	Date

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

<input type="checkbox"/> Decline <input type="checkbox"/> Accept <input checked="" type="checkbox"/> Accept Labwide <input type="checkbox"/> with Modification:			
POC Tobin Oruch	Z Number 120812	Signature Electronic signature on file	Date 12/01/15

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

<input checked="" type="checkbox"/> Accepted <input type="checkbox"/> Accepted with comments <input type="checkbox"/> Declined			
Comments:			
Safety or Security Management Program Owner Lawrence K. Goen	Z Number 106351	Signature Signature on file	Date 12-2-15

VAR 16-009 Attachment 1

IBC Program Streamlined Graded Approach (to replace GEN flowchart, etc.)

Requirements Work Type	Test & Insp Plan	Design Review ¹	Permit	Inspection/Test ²	Cert. of Occupancy
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); performing org otherwise	n/a
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); performing org otherwise	n/a
Level 2B Alteration. Same as 2A but has: <ul style="list-style-type: none"> Possible egress aspects (workspace reconfiguration or door or window addition or elimination) and/or Life safety or related systems affected <p>—or—</p> Level 3 Alteration or above: <ol style="list-style-type: none"> New building, relocation, change of occupancy, or expansion/addition, Work area exceeds 50 percent of the aggregate area of the building, and/or Complex reroofing (parapet bracing, overlays, changing from low slope to steep slope or adding a ballast. Structural demolition (see IBC-GEN article on this) 	Required	EPD Core IBC SMEs + FP-DO	LBO	CM-CE	LBO

CONSTANTS WITH THE ABOVE

- 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 kept and will be assessed by LBO (nominally January for previous CY).
- SSI:** When required by IBC 1704.3, Statement of Special Inspections per IBC-IP and its Att B must be developed/used.

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; 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 self-performed for IBC Program purposes due to 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 system is LANL-specific (not present in IEBC).

Preliminary Project Determinations

IEBC Work Class, IBC Use/Occupancy Class, Risk Level, PC/RC/NDC, etc.

All proposed IBC work (aka-ESM calls all work "projects") must receive preliminary determination of the following from the Facility Design Authority Representative (FDAR):

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

C. Determination of the risk level (H, M, L) per IBC-GEN Figure 1, IBC Program Three Tiered Approach Flowchart

Requestor Input to FDAR

Project Name/Location:
Hazardous materials in occupancy (if yes, describe existing inventory and effect of project, or refer to and attach Form 2, HazMat Determination/Chemical Inventory)
Estimated cost of work:
Statement of Work and proposed IEBC Ch. 4 Work Classification(s) – by subtasks if differing:
<i>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. <u>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</u></i>
Proposed IBC Ch. 3 Use and Occupancy Class(es) with rationale (N/A unless potentially changing from design basis or current levels):
Does work involve any special inspection tasks such as: <input type="checkbox"/> N/A fire barrier penetrations? <input type="checkbox"/> structural anchorage, concrete, steel, or masonry? <input type="checkbox"/> reroofing? <input type="checkbox"/> EIFS (synthetic stucco)? <input type="checkbox"/> fire coatings? <input type="checkbox"/> other IBC Ch. 17 task? <input type="checkbox"/> <i>-(results in Moderate Risk as a minimum)</i>
Risk level per IBC-GEN Figure 1, IBC Program Three Tiered Approach Flowchart: <input type="checkbox"/> Highest <input type="checkbox"/> Moderate <input type="checkbox"/> Lowest
If self-perform, submittal reduction eligibility potential per ESM Ch. 1 Section Z10 Att. F criteria? <input type="checkbox"/> Yes <input type="checkbox"/> No
Eligible for sketches only (vs. drawings) per CAD Manual? <input type="checkbox"/> Yes <input type="checkbox"/> No
Existing facility mods: Qualifies for code of record design per criteria in IBC-GEN Att. B, LANL Existing Building Code <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A If yes, COR date: _____
For IEBC Alt Level 2 and 3 adding additional loads on seismic-force-resisting SSCs, must a feasibility study be performed? <input type="checkbox"/> Yes <input type="checkbox"/> No
NPH: PC, RC, or NDC/LS category (see instructions for guidance):
Statement of Special Inspections per IBC-IP required by IBC 1704.3? <input type="checkbox"/> Yes <input type="checkbox"/> No
Sustainable design review required to ensure meets ESM Ch. 14? <input type="checkbox"/> Yes <input type="checkbox"/> No
Commissioning required per ESM Ch. 15? <input type="checkbox"/> Yes <input type="checkbox"/> No
Existing nuclear facility "major modification" ² <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Other information helpful to determinations to be made:

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.

² 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).

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
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~~When “Repair” only: Remainder of this form is unneeded and need not be printed/retained as a record; also, other formal FDAR processes for determining IBC or not, being a repair, and repair risk level determinations equivalent to this form are acceptable. If the FDAR has any uncertainty regarding being a “Repair”, form must proceed to C/S/A Team as described below.~~

~~When more than “Repair,” ES-EPD core team concurrence is required.~~

~~When work type is more than “Repair” per this form’s definition, the project shall gain concurrence from the LANL Building Official (LBO) Civil/Structural/Architectural Team Leader (ES-EPD). **Either the FDAR or Project transmits to ES-EPD CSA Team (ESR preferred method).**~~

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

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 the C/S/A Team LANL during design review as “C” comments (with a basis).

Final determinations are documented by the final, LBO-approved/permitted design. Please print except for signature.

~~**CSA Team Leader Preliminary Determinations**~~

~~The CSA TL will involve other disciplines as appropriate in making determinations and communicate any differing opinion and its basis to the Requester by email. If not accepted, then the LBO Deputy for Design Review (ES-EPD GL) will resolve, involving others as appropriate.~~

<input type="checkbox"/> Accept <input type="checkbox"/> Accept with Modification:			
Optional Comments/Determinations (e.g., key requirements triggered—accessibility per IEBC, lateral bracing per IBC 1613.1, R&D equipment anchorage, seismic retrofit per ICSSC RP 8, etc.):			
Name	Z-Number	Signature	Date

~~**Final Determination by LBO or Deputy if Appealed (n/a if not required)**~~

<input type="checkbox"/> Accept CSA Team Determination <input type="checkbox"/> Accept with Modification:			
Name	Z-Number	Signature	Date

~~Once the determinations are made, CSA TL returns to Requester.~~ The completed form should be retained by the project as a record.

DEFINITIONS, PC/RC/NDC CATEGORIES, AND IBC-TRIGGERED-WORK OVERVIEW
(need not print with form; not part of record)

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 (a majority of the original remains). 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. 76.

Level 2 alterations include the reconfiguration of space, the addition or elimination of any door or window, the reconfiguration or extension of any system, or the installation of any additional equipment. Must follow IEBC Ch. 76 and 87.

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. 7-96-8.

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. A change in the purpose or level of activity within a building that involves a change in the application of requirements of the code including referenced codes. E.g., adding people or hazardous chemicals must be analyzed for impact. Must follow IEBC Ch. 109.

Addition. An extension or increase in floor area, number of stories, or height of a building or structure. Must follow IEBC Ch. 119.

Historic Building. (at time of writing, LANL has a few at or near S-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. 124.

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.

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 ~~34~~. See IECC ~~404.4C501~~ and ESM Ch. 14.

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

1. Go to LANL Homepage, & click on More Tools at the bottom of Top Tools.
2. On the Top Tools page, select ARCHIBUS WEB Central, & click on Guest Sign In.
3. Click on Facility Information, then FIMS, & then FIMS Common Data Elements Console.
4. Type TA-Bldg No (i.e., __ - __ __) under Structure Code, & then click Filter.
5. Move the scroll bar approx. $\frac{3}{4}$ of the way across the screen, until you see/read Seismic Essential.
6. 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.

IEBC REPAIR AND ALTERATION TRIGGERED-WORK OVERVIEW/GUIDANCE

Comment [TO1]: Delete this table

Note: Refer to IEBC (and LANL amendments in IBC-GEN Att. B) for actual requirements. Table does not address changes in level of use or occupancy, nor additions; see IEBC Ch. 10 and 11 respectively.

General: Work can never make the building less safe or less conforming with IBC. Any Alteration work area must left accessible per IEBC 705 unless *technically infeasible* (see all definitions above). Dangerous structural conditions must be rendered safe (ref. IEBC Ch. 2 definition, etc.).

Building Element or System being Repaired or Altered	Repairs Chapter 6		Level 1 Alterations Chapter 7		Level 2 Alterations Chapter 8		Level 3 Alterations Chapter 9	
	Planned work	Triggered Work	Planned Work	Triggered Work	Planned work	Triggered Work	Planned work	Triggered Work
Building Elements and Materials	Using like material when originally code-compliant	None, but if needed use like materials, then use ESM-compliant ones. Must replace broken glass with safety glazing in hazardous locations (602.3)	New work or interior finish work	Finishes and new work meet ESM, IBC, and other applicable building codes (fuel gas per 702.6.1) Accessibility improvements (see General note above, probably rarely triggered) When reroofing: parapet and wall anchor work	Alteration per definition above	Comply with Ch 8 (accessibility, etc.) Additional mods in work area or beyond work area may be required (see 703-4; when work area affects 2+ tenants, egress per 805) When reroofing: parapet and wall anchor work Wiring upgrades in A-1, -2, -5, and H (808.2) Ventilation (809) UPC plumbing fixture count when 20% demand increase (810)	Alteration per definition above	Comply with IEBC Ch. 6 & 7 (including 703-5 in work areas in all cases). Additional mods in work area or beyond work area may also be required (see 803-5)
Means of Egress	Maintaining level of protection	none	replacement materials and methods maintaining level of protection	Accessibility (see General note above)	Reconfiguration of egress spaces	Improvements in work area, floor, or building per above	Reconfiguration of egress spaces	Improvements in work area, floor, or building per above
Accessibility	Maintaining level of protection	none	See Building Elements and Materials above	Accessibility (see General note above)	Accessibility work resulting from a Level 4-2 Alt	None; just 806: Must meet Ch 7. If adding a stair, must include accessible	Accessibility work resulting from a Level 4-3 Alt	None; just Must meet IEBC Ch 6Z.

Building Element or System being Repaired or Altered	Repairs Chapter 6		Level 1 Alterations Chapter 7		Level 2 Alterations Chapter 8		Level 3 Alterations Chapter 9	
	Planned work	Triggered Work	Planned Work	Triggered Work	Planned work	Triggered Work	Planned work	Triggered Work
						route		
Structural	Using like material	none, but work due to damage must be per 606.2	Replacement of equipment or roofing which are dead loads (on structure), other reroofing,	See IEBC 707 Always: accessibility (see General note above)	New gravity loads and snow drift effect (cumulative)	See IEBC 807 if 5% or more stress increase	New gravity loads	See 907
					New lateral loads	See 807.5		
					Voluntary Improvement of seismic-force-resisting system (those per IEBC App A permitted)	No less conforming or worse irregularities, new and relocated elements per ESM Ch. 5		
Fire protection systems (alarm, suppression)	Using like material and maintaining level of protection	none						
Electrical, Mechanical, and Plumbing	Using like material	None, except E: Certain receptacle and grounding upgrades required M: Forced draft ventilation for fuel-burning appliances where desired/needed P: Materials per UPC	See Building Elements and Materials above	See Building Elements and Materials above	Reconfiguration or extension of a system, or installation of a new system	See Building Elements and Materials above	Reconfiguration or extension of a system, or installation of a new system	See Building Elements and Materials above
Energy Conservation	Meet IECC C504		New elements/materials in work area must meet IECC C503		Same as Level 1 + envelope upgrades if conditioning formerly unconditioned per IECC C503		Same as Level 1, but also see ESM Ch. 14 for possible additional requirements for major renovations	

Chapter/Section references are to IEBC-2015 unless noted otherwise (e.g., ESM). Table provided for overall understanding only; refer to and comply with IEBC (and IECC for energy conservation) as amended by LANL for all work scope determinations vice this table.