Conduct of Engineering
Request for Variance or Alternate Method

1.0 General

1.1 Document Number: VAR-10128	1.2 Revision: 0

1.3 Brief Descriptive Title: Acceptance of Engineered Piping Supports

1.4 Affected Program: Engineering Standards	1.5 Request Type: Alternate Method

1.6a Affected Tech Area 99	1.6b Affected Buildings Sitewide

1.7 Requestor: Swartz, Ari (Ben)   Organization: ES-EPD

1.8 Revision History
   Revision Number   Changes and Comments
   Rev. 0   Initial issue.

2.0 Affected Conduct of Engineering Program/Documents

2.1 Affected "P" Document: P342 Engineering Standards If against the P document itself, revision (or **N/A**): N/A	2.2 Subordinate or related document(s) [AP, master spec, LANL ESM chapter & section; or code, Order, standard, etc.]: Document Title/No.: LANL Engineering Standards Manual STD-342-100 Chapter 17, Pressure Safety Section ADMIN-2 Design, Documentation, and Records Revision Rev. 0, 9/17/2014

2.3 Section/Paragraph: S. Piping Supports and Flexibility Analysis

2.4 Specific Requirement(s) as Written in the Document(s):
1. Follow B31.3 Process Piping for piping supports.

2.5 Contractual, preference, or other basis for requirement:
Contractual; ESM Ch 17 and ASME B31 series trace to 10CFR851.

2.6 Type of VAR from ESM Chap 1, Z10 [*Applies only to standards variances*) Type 2	2.7 Discipline Pressure Safety

3.0 Request Information & Comments

3.1 NCR required (work has occurred)? No
If Yes, NCR Number: Enter text.

3.2 System/Component Affected	3.3 Highest ML Level
OpSystem Acronym & Name [Select OpSysAcronymAndName] System Number or Name [Select SystemNumberOrName]	ML-1

3.4 Proposal with Justification/Compensatory Measures:

Proposal

When a structural design is presented by a qualified designer and accepted by the LANL structural SME(s), the design shall be accepted by the owner's representative as meeting the ASME B31 piping support element fixtures requirements.

The design shall be considered as meeting or exceeding the minimum code requirements.

This Alternative Method is applicable to ASME B31.3, B31.5, and B31.9 Codes. That is because ESM Chapter 17, Pressure Safety, Section GEN - General Requirements Rev. 0, 9/17/2014, 1.0 General A. Introduction and Applicability, paragraph 5, states: "However, the most applicable code must be used for design, fabrication, inspection, and testing; take requirements in this document referring to or taken from B31.3 to mean the corresponding provisions in the applicable B31 code." This means apply piping supports per the B31 code that is most applicable.

Background

As stated in the introduction to ASME B31 "The Code is not a design handbook. The requirements of this Code generally employ a simplified approach."

The application of this Alternative Method shall be limited to the fixtures (not structural attachments) as defined by ASME B31.3-2014 300.2 Definitions shown below:

> *pipe-supporting elements:* pipe-supporting elements consist of fixtures and structural attachments as follows:
> *(a) fixtures:* fixtures include elements that transfer the load from the pipe or structural attachment to the supporting structure or equipment. They include hanging type fixtures, such as hanger rods, spring hangers, sway braces, counterweights, turnbuckles, struts, chains, guides, and anchors; and bearing type fixtures, such as saddles, bases, rollers, brackets, and sliding supports.
> *(b) structural attachments:* structural attachments include elements that are welded, bolted, or clamped to the pipe, such as clips, lugs, rings, clamps, clevises, straps, and skirts.

Justification

ASME B31.3-2014

300 GENERAL STATEMENTS

(c) Intent of the Code
(3) The Code generally employs a simplified approach for many of its requirements. A designer capable of applying a more complete and rigorous analysis consistent with the design criteria of this Code shall have the latitude of applying such analysis in the development

of designs and fabrications. The designer shall provide details of design, construction, examination, and testing, along with calculations consistent with the design criteria of this Code. The details shall be documented in the engineering design and their validity <mark>accepted by the owner</mark>.

300.2 Definitions

pipe-supporting elements: pipe-supporting elements consist of fixtures and structural attachments as follows:
(a) <mark>*fixtures*</mark>*:* fixtures include elements that transfer the load from the pipe or structural attachment to the supporting structure or equipment. They include hanging type fixtures, such as hanger rods, spring hangers, sway braces, counterweights, turnbuckles, struts, chains, guides, and anchors; and bearing type fixtures, such as saddles, bases, rollers, brackets, and sliding supports.
(b) structural attachments: structural attachments include elements that are welded, bolted, or clamped to the pipe, such as clips, lugs, rings, clamps, clevises, straps, and skirts.

ASME B31.9-2014

900 GENERAL

Engineering requirements of this Code, while considered necessary and adequate for safe design, generally employ a simplified approach. An engineer capable of applying a more rigorous analysis shall have the latitude to do so. He must be able to demonstrate the validity of his approach.

ASME B31.5-2013

Introduction

The designer is cautioned that the Code is not a design handbook. <mark>The Code does not eliminate the need for the designer or competent engineering judgment</mark>.

500 GENERAL STATEMENTS

This Refrigeration Piping and Heat Transfer Components Code is a Section of the American Society of Mechanical Engineers Code for Pressure Piping, B31. This Section is published as a separate document for simplicity and for convenience of Code users. The users of this Code are advised that in some areas legislation may establish governmental jurisdiction over the subject matter covered by the Code. <mark>The owner of a piping installation shall choose which piping code(s) are applicable to the installation and shall have the overall responsibility for compliance with this Code.</mark> (See Nonmandatory Appendix C.) The owner of a complete piping installation shall have the overall responsibility for compliance with this Code.

It is required that the engineering design specify any special requirements pertinent to the particular service involved. For example, the engineering design shall not for any service specify a weld quality lower than that stipulated in para. 527.3.2(d) for the Code-required visual examination quality and for the types of welds involved; but where service requirements necessitate

added quality and more extensive nondestructive examination, these are to be specified in the engineering design and any revision thereto, and when so specified, the Code requires that they be accomplished.

Limitations

This Alternative Method is only to be applied when engineered fixtures (pipe supports) are employed. Non-engineered fixtures (e.g., off-the-shelf as listed in specifications) shall meet the applicable ASME B31 Code of Record.

3.5 Attachments

Document Title or Description none

3.6a Project ID	3.6b: Project Name
[ProjectIdentifier]	Click here to enter text.

3.7 Duration:	3.8a Finite Period Start Date:	3.8b End Date:
Lifetime	Click to enter a date.	Click to enter a date

3.8c When finite life, provide the PFITS number for tracking removal/correction: [PFITSNum]

3.9 USQD/USID required (Nuclear, High/Mod Hazard)?   No

 If Yes, USQD/USID Number   Click here to enter text.

3.10 QA Review for process change matters potentially affecting LANL's NQA-1 implementation

 Is a QPA Determination required?: No   If **Yes**, then: Choose an item.

 QPA Comments: Enter text..

3.11 POC Determination: Accept with Comment

   POC Comments: This Alternative Method shall apply to all designs at LANL. Items welded or otherwise attached to the piping shall comply with ASME B31 code.

3.12 Management Program Owner's (SMPO) Approval for P341 and APs; P342, ESM, ML-1 and -2, and Contract Matters; and P343

SMPO Determination: Accept

 Comments: Enter text..

4.0 Participant Signatures <u>NOTE</u>: *DO NOT ADD NAMES FROM WITHIN WORD!* <u>Save and close the form first</u>, then do 1-4 below:

1. *From the SharePoint library, select the document, then click the **ellipsis (…)** in the second column; a small dialog appears*
2. *In the small dialog click the **ellipsis** again*
3. *Click **Edit Properties** and check out the document if prompted toEnter names using the controls provided, then **Save***

4.1 POC (Management Program Owner's Representative): Swartz, Ari (Ben)	Organization ES-EPD	Signature

4.2 Facility Design Authority Representative [FDARName] FDAR signature not required ☒	Organization Enter text..	Signature
4.3 LANL Owning Manager (FOD or R&D/Program) FOD or Program Manager signature not required ☒	Organization Enter text..	Signature
4.4 Quality Reviewer's Name: [QPAName] QPA review/signature not required ☒	Organization Enter text.	Signature
4.5 Safety or Security Management Program Owner's Approval for P341 and APs; P342, ESM and Contract Matters; and P343 Goen, Lawrence Kenneth SMPO signature not required (Type 1 variance) ☐	Organization ES-DO	Signature
4.6 Additional Signer 1 [AdditionalSigner1] Role: Enter text.	Organization Enter text.	Signature
4.7 Additional Signer 2 [AdditionalSigner2] Role: Enter text.	Organization Enter text.	Signature

4.8 CoE Administrator Signature Salazar-Barnes, Christina [CoEAdminSign] NOTE: The CoE Admin is always the last signature placed on this document. The date of that signing is the date of this document.	Signature