


Amber M. Kenney  
Chief Safety Officer

**ES&H Section**  
P.O. Box 500, MS 119  
Kirk Road and Pine Street  
Batavia, Illinois 60510-5011  
USA  
Office: 630.840.3511  
[tamber@fnal.gov](mailto:tamber@fnal.gov)

**Date:** November 25, 2019  
**To:** Kate Gregory, Chief Operating Officer  
**From:** Amber Kenney   
**Re:** FESHM 5033 – Vacuum Vessel Safety

---

This chapter has been updated as detailed below and sent for labwide review:


FESHM 5033 – Vacuum Vessel Safety:

- Added reference to FESHM 5031.5 to introduction section. Clarified that exceptional load cases do not need a separate low-pressure vessel engineering note
- Added EN13445 as an alternative Code in Section 3.0.
- Created new section on evaluating buckling using FEA and Div. 2 Part 5. Changed buckling safety factor requirement from 3.5 to 2.5 for linear elastic analysis type analysis when no plasticity present. Added requirements and flow chart instructions for performing a non-linear material and geometry analysis for any vessels with any plasticity occurring at design load.
- Clarified guidance on weld joint efficiencies and weld inspection
- Added references to API and EN standards covering pressure relief device sizing
- Added instructions for uploading engineering notes to Teamcenter in Section 6.1

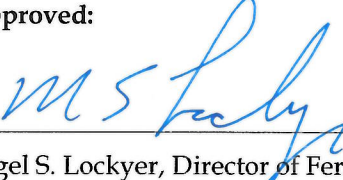
All comments received during the review period have been addressed by Subject Matter Experts and the updated chapter is ready for approval and release.

The chapter has been sent to you and Lisa Vega electronically. If a paper copy is required, you may either print one out or contact Lisa and she will provide one to you. After Directorate approval, please return this approval page to Kristy Gibson at MS119 for posting.

**Recommended for Approval:**

  
\_\_\_\_\_  
Katherine L. Gregory, Chief Operating Officer      11/26/19  
Date

**Approved:**

  
\_\_\_\_\_  
Nigel S. Lockyer, Director of Fermilab      12/3/19  
Date