Fermilab

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Memorandum

September 29, 2006

To: Bruce Chrisman

From: William Griffing

Subject: Revised FESHM chapter 5031.4 - Inspection and Testing of Relief Systems

Enclosed you will find revised FESHM chapter 5031.4, "Inspection and Testing of Relief Systems." This chapter has been revised to reflect current operations. It was posted for site wide review and all comments were addressed.

After final approval, please return this approval page to Elizabeth May at MS119 for posting on the web.

Encl.

Recommended for Approval:

Bruce Chrisman — Date 9/29/06

Approved:

Piermaria Oddone — Date 10/9/06

INSPECTION AND TESTING OF RELIEF SYSTEMS

(Formerly Chapter 5032.2)

INTRODUCTION

Relief systems must be periodically inspected and maintained in order to assure proper operation. This chapter specifies an inspection and testing program for all pressure vessel relief systems that are required under the provisions of the Fermilab ES&H Manual Section 5031. This chapter applies to non-code stamped parallel plate relief devices typically used on vacuum vessels and insulating vacuum spaces covered by FESHM 5033. This chapter applies to non-code stamped relief valves used on low pressure (less than 15 psig) vessels covered by FESHM 5031.5

DEFINITIONS

Primary relief devices are those that are required by the provisions of the Fermilab ES&H Manual Section 5031, 5033, and 5031.5.

Primary relief systems consist of primary relief devices and their inlet and outlet piping.

The protected system is the piping, vessel, or system of piping and vessels for which the primary relief system is required.

External inspection consists of verifying, to the extent possible without disassembling the relief system or removing relief devices, that:

a. the relief devices are the same as those described in Engineering Notes,

b. the outlet or discharge piping of relief devices has remained unrestricted,

c. the inlet and outlet piping of the relief system have not been changed in a way that would reduce the relief capacity given in Engineering Notes, and

d. the relief devices have not undergone severe corrosion or tampering.

Testing of a re-closing relief device consists of verifying that its set pressure satisfies the requirements of ASME Code Section VIII Division 1 paragraphs UG-126 and UG-134 or Division 2 Article R-1 for code stamped relief valves or other Codes/Standards as required by the affected vessel Engineering Note. For non-code stamped relief valves used on low pressure or vacuum vessels, use engineering judgment in determining if the set pressure and valve opening are appropriate for the service conditions.

a. The relief device may be tested in place provided the test pressure does not exceed the maximum allowable working pressure of the protected system; otherwise, the relief device must be removed for testing.

RESPONSIBILITIES

The division/section head who controls the area of operation of the protected system is responsible for carrying out the requirements of this chapter. The Mechanical or Cryogenic Safety Subcommittee(s) will serve in a consulting capacity to division/section heads in all matters concerning the inspection and testing of relief systems. The ES&H Section shall, as part of the Fermilab Self Assessment Program Plan (SAP), audit divisions/sections for compliance with this chapter.

Each division / section shall be responsible for maintaining a database of relief valve information and updating whenever a relief valve is changed, added, inspected, or removed from service for relief valves on systems within the division or section.

PROCEDURE

1. External Inspection: An external inspection of each primary relief system must be made prior to initial operation of the protected system. The inspection must be repeated at regular intervals. The maximum interval between inspections may not exceed three years.

2. Testing of Relief Devices:

a. Re-closing primary relief devices must be tested prior to their installation. The testing must be repeated at regular intervals. The maximum interval between tests may not exceed six years. In the case of new and not previously used relief devices, certification of the set pressure by the manufacturer will be considered to constitute a test. In this case, the test date will be considered to be the date on which the relief device was delivered at Fermilab and the requirement for further testing prior to installation will be waived.

b. Non-re-closing (burst disk) and parallel plate primary relief devices (used on vacuum vessels and insulating vacuum spaces) need not be tested, but must be inspected every three years.

c. If a protected system is provided with n sets of primary relief devices, each of the sets individually satisfies all Fermilab ES&H Manual requirements, and each of the sets is always connected to the protected system, then the interval between tests specified in 2.a. may be extended to n times six years.

3. Corrective Actions: Immediate corrective actions must be taken if any inspection indicates that a primary relief device may not operate properly. The actions must ensure that the failure of the relief device to operate properly will not result in a safety hazard.

4. Records: A record of the inspections and tests of each primary relief system and each primary relief device shall be maintained by the person responsible for the protected system. These records shall contain vessel identification numbers, relief device specifications, and such documents as are necessary to record the results of inspections, repairs, alterations, or re-ratings of the relief system and devices. These records should be retained and preferably attached to a copy of the relevant Engineering Note(s). A suggested format of the Relief Device Maintenance/Test Record is shown in the Technical Appendix.

5. Existing Systems: If an existing primary relief system is found not meeting the requirements of this chapter, immediate corrective actions must be taken to ensure safety. This may include taking the system out of service or incorporating administrative controls to assure safety until the system can be brought into compliance. Thereafter, the inspection and testing intervals specified in 1 and 2 apply.

5031.4TA

TECHNICAL APENDIX TO

INSPECTION AND TESTING OF RELIEF SYSTEMS

Relief Device Maintenance/Test Record

Vessel Identification Numbers

Vessel Description

Physical Location

Relief Device Number

Relief Device Manufacturer

Model Number

Set Pressure

MAWP of the Vessel

Relief Device Type _____ Spring Operated _____ Pilot Operated _____ Parallel Plate

_____ Rupture Disk _____ Other: describe _____

Date	Inspection	Start to	Reset	Condition	
Disposition	Inspector	Type	Discharge	Pressure	Comments