{CLIENT SITE} – {CLIENT COMPANY}

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PSM Coordinator {Issue Date} {Revision Number} {Revision Date} 10

MECHANICAL INTEGRITY PROCEDURES

PURPOSE

The Occupational Safety and Health Administration (OSHA) Process Safety Management (PSM) element and the corresponding Environmental Protection Agency (EPA) Risk Management Program (RM Program) regulation element relating to Mechanical Integrity is to ensure equipment is designed and installed correctly, in addition to being operated and maintained properly. The purpose of this Mechanical Integrity Program is to ensure that the refrigeration system components used to handle and store ammonia are properly designed, operated, and maintained.

SCOPE

This document summarizes how **{Client Company}** complies with the requirements of the PSM, Mechanical Integrity element, 29 CFR §1910.119 (j), and the EPA RM Program, Mechanical Integrity element, 40 CFR §68.73. A comprehensive maintenance and Mechanical Integrity Program comprises many elements. It consists of the specific pieces of equipment and system components that are to be maintained, the planned maintenance activities to be performed, inspections and follow-up, training and documentation, and quality assurance activities.

Specific system components included in the Mechanical Integrity Program include as a minimum, but are not limited to:

- Pressure vessels and storage tanks
- Piping systems (including piping components such as valves)
- Auxiliary safety systems (including relief and vent systems and devices, vapor detection systems, and ventilation systems)
- Emergency shutdown systems
- Controls (including monitoring sensors, alarms and interlocks)
- Pumps
- Compressors
- Condensers
- Evaporators



IMPLEMENTATION OVERVIEW (continued)

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PROCEDURES

al Integrity Program is composite ogram, including:

Equipment Inventory Inspection and Testing Program Training for Process Maintenance Activit Quality Assurance

1.0 EQUIPMENT INVENTORY

leces of ammonia refrigeration system equipment are nformation is summarized in an equipment list general des technical information and key equipment specificate tenance scheduling for each piece or type of equipment on the equipment lists is consistent with informati record file of each component and/or from surer's reference manuals. Equipment lists are modifie information changes.

iles for all equipment lists and documentation rela nts, which typically include instruction manuals, warrant inspection and repair records, and any other relevan of for each specific component. These files are also rehere all inspection and testing forms and records naintained. In most cases, the majority of the instruufacturer's information are grouped together in a pplied by the system installation contractor, and apponent files. Refer to *Form MI-1* for a list of **Client Company's** ammonia refrigeration

2.0 INSPECTION AND TESTING

upment or group of equipr

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at pieces of equipment at CMMS.

ponent or subsystem (e.g. compression) (stem, etc.) included in the inventor esting history log kept in the individual rec ivities are recorded. This log includes the re a description of all maintenance activities pe

nance, inspection, and testing history log d ig each inspection and test that has been perform The required information included on the form is:

the date of the inspection or test;

the name of the person who performed the inspection the serial number of the other identifier of the equipm inspected or tested;

a description of the inspection or test performed; and the results of the inspection or test.

on concerning type of test or inspection for specific pied ound in the vendor or manufacturer's recommendation It list provided by the CMMS or the manufacturer's equi Form MI-1 is a list of available reference manuals on system and related components.

ment deficiencies found during any inspections limits are corrected before further use, or in a safe sary means are taken to assure safe interim op ncies, when they are found and when they kept in the individual record file.

> ed in the testing and inspection of syste ent are trained and/or certified to perfo p or applicable industry standards.

> > sting is performed by a co odure and copies of the part of the

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3.0	TRAINING FOR PROCESS MAINTENANCE ACTIVITIES					
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	process and no.					
	applicable to the empty					
	ng classes.					
	mar of onep safety meetings.					
	y } verifies that the employee can perform					
	Ition operating engineers are trained prior to b Ill receive additional training as appropriate s. Training information is maintained in the employ PSM Coordinators' office.					
	ration operating ongineers are trained in (Client C					
	ctices prior to starting work at the site (i.e. Hot Work,					
	eration-operating engineers are provided with acces ance Procedures and manufacturer's equipment manual					
40						
10						
	ionia refrigeration systems at {Client Company} were o					
	under the supervision of persons who by reason of knowing the supervision of persons who by reason of knowing the tasks. Such persons inclusion of the tasks.					
	Experienced refrigeration contractors, possibly in congineering code authority, authorized inspection a surance underwriter					
	house design/engineering/operations staff of the sulting engineers, acting on behalf of the emperation equipment supplier					
	eration service vendors					
	<pre>mpany's} responsibility to ensure</pre>					
	are qualified for their relevant					
	rocedures outlined in the					
	cumentation on co					

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rm U-1A)

decifications
cation, drawing, size, type, manufacturer,
d (equipment, valve positions – startup, nornest reports

sary Process Safety Information (PSI), see PSI

ation will be kept on file in the PSM coordinators o

ate checks and inspections are performed to ensure ion system components, including contractor-sup ' properly and consistent with design specifica turer's instructions.

ntial records and documentation relevant to the ammo obtained by **{Client Company}** are maintained by **{Clie**n If Coordinator, and are readily available to those on, maintenance and operation.

Company} ensures that all maintenance materials, refrigeration system components, including contractor ble for the application for which they are used and th ly suitable for the application for which they may

system repair requests are brought to the atter immediate Supervisor and recorded in the refrie Facilities Manager determines the urger oppropriate time for the repair.

FORMS

sted for use. These forms as or documentation ar comply with the

Mechanical Integrity Procedures - AMMONIA {Client Company} – Anytown, USA Facility

{CLIENT COMPANY} AMMONIA REFRIGERATION SYSTEM REFERENCE INFORMATION LIST

Manufacturer	Revision Date	Title:	Description:	Additional Information
Frick	S70-301 IOM/Aug 2001	Instruction Operation Maintenance Manual RDB – Booster Rotary Screw Compressor	Compressor/Equipment Data; Service Manual	Located in Engine Room Office
Frick	S70-400 IOM/Aug 2001	Instruction Operation Maint. Manual RXF – Rotary Screw Compressor Models 12-101	Compressor/Equipment Data; Service Manual	Located in Engine Room Office
Frick	S700-600 IOM/May 2001	Instruction Operation Maintenance RWF – Rotary Screw Compressor Models 100 through 480	Compressor/Equipment Data; Service Manual	Located in Engine Room Office
Frick	S90-010 O/APR 2002	Operation – Frick Quantum Compressor Control Panel Version 4.5x	Compressor Control Panel Service Manual	Located in Engine Room Office
RAM	Nov 00 / Rev. 2	Instruction and Maintenance	Refrigeration Duty Motors – Low and Medium Voltage Polyphase Motors	Located in Engine Room Office

FORM	MI_1
	1111-1

Manufacturer	Revision Date	Title:	Description:	Additional Information
Frick	RWBII Plus Addendum /Nov 93	Addendum to Service Parts List for RWBII Plus	Rotary Screw Compressor Units with Plus Microprocessor Control Models 60 through 676	Located in Engine Room Office
Frick	S70-115 10M/ Jul 83	Instruction Operation Maintenance	Frick RWB II Rotary Screw Compressor Units	Located in Engine Room Office
Frick	S70-113 IOM Addendum 1/Apr 84	Installation Operation Maintenance	Rotary Screw Compressor Units with Plus Microprocessor Control Series – RWB	Located in Engine Room Office
Daily records and inspections		Daily records and inspections	The day to day readings from the equipment that monitors the ammonia system.	Located in Engine Room

APPENDIX A

EQUIPMENT LIST

Mechanical Integrity Procedures - AMMONIA {Client Company} – Anytown, USA Facility