AMMONIA REFRIGERATION TERMINOLOGIES AND ACRONYMS

A-B-C-D-E-F-G-H-I-J-K-L-M-N-O-P-Q-R-S-T-U-V-W-X-Y-Z

TERMS	DEFINITIONS
1% NH3	10,000 ppm
29 CFR 1910.119	OSHA's Process Safety Management Standard 29 CFR 1910.119
40 CFR 68	EPA's Risk Management Plan Standard 40 CFR Part 68
AA	Anhydrous Ammonia
AAD	OSHA's Assistant Area Director
AC	Alternating Current. It is a type of current where the polarity is perpetually reversing, causing the directional flow in a circuit to reverse at regular intervals
ACC	Accumulator-prevents liquid from entering the suction compressor. It is also referred to as the Suction Accumulator
ACCA	ACCA is a non-profit association whose membership includes more than 60,000 professionals and 4,000 businesses in the indoor environment and energy services community. Website: www.acca.org
ACGIH	American Conference of Government Industrial Hygienists
Acoustical	The science of sound, relating to sound, or a sense of hearing
Actuator	An Actuator is the portion of a regulating valve that converts mechanical fluid, thermal energy, or electrical energy into mechanical motion to open or close valve seats
AD	OSHA's Area Director
ADB	Ammonia Data Book by IIAR AEV Valve Identification for Ammonia Expansion Valve
AFUE	Annual Fuel Utilization Efficiency. It is a measurement used to rate furnace efficiencies by dividing the ratio of heat output by heat input AGA American Gas Association, Inc.
AHJ	Authority Having Jurisdiction. It is defined as the organization, office, or individual responsible for approving layout drawings, equipment, an installation or a procedure or enforcing the requirements of a code or standard. Usually, the AHJ is the building and/or fire official of the city, county, or state in which the job site is located. In certain cases, such as health care facilities, transient accommodations and day care facilities, the AHJ is the city or county building and/or fire official and the chef of the state patrol, through the director of fire protection.
AHRI	The Air-Conditioning, Heating, and Refrigeration Institute. It is the trade association representing manufacturers of HVACR and water heating. Website: www.ahrinet.org.
Air Conditioner	It is a device that changes humidity levels, temperature or quality of air.

TERMS	DEFINITIONS
Air-Cooled System	It is a type of precision cooling system widely used in IT environments of all sizes. In an air-cooled system, the condensing coil is exposed directly to the outside atmosphere. All other refrigerant cycle components are contained within the air conditioner. This sometimes requires refrigerant lines to be run long distances to the building's roof or external perimeter
Airflow Volume	It is measured in cubic feet per minute (cfm). It is the amount of air circulated in a space.
Air Handler	It is the indoor part of the air conditioning system including the circulating fan and evaporator (summer) / condenser (winter) coil.
Ambient Temperature	It is the average temperature of the medium, usually air, surrounding the object under consideration
Ampere	Ampere is a unit of measure referring to the flow of electrons within a circuit. Both voltage (Pressure) and amperage (Flow) are required or must be available to produce work (Watts). In a circuit with a fixed resistance (Ohms), the value of volts vs amps will change inversely in relation to each other
ANSI	American National Standards Institute
ANSI/ASHRAE	
Standard 15	Safety Code for Mechanical Refrigeration
ANSI/ASHRAE	
Standard 34	Designation and Safety Classifications of Refrigerants
ANSI/IIAR 2-2008a	American National Standard for Equipment, Design & Installation of Ammonia Mechanical Refrigerating Systems
ANSI/IIAR 3-2005	Ammonia Refrigeration Valves
ANSI/ISA – S5-1984	Instrumentation Symbols and Identification
ANSI/NFPA 70	National Electric Code
AO	OSHA's Area Office
API	American Petroleum Institute
Apparent Thermal	
Conductivity	It is the thermal conductivity assigned to a material that exhibits thermal transmission by several modes of heat transfer, resulting in property variation with specimen thickness or surface emittance
Apparent Thermal	
Resistivity (R-value)	It is the thermal resistivity assigned to a material that exhibits thermal transmission by several modes of heat transfer, resulting in property variation with specimen thickness or surface emittance Application Temperature Limits It is the minimum and maximum temperatures between which it is usually safe to service finishes, adhesives, and sealants without endangering the integrity of the material

TERMS	DEFINITIONS
ARM	IIAR's Ammonia Refrigeration Management Program was developed to assist smaller facilities under 10, 000 lbs. of Ammonia
ARTG IIAR's	Ammonia Refrigeration Training Guideline
ASHRAE	American Society of Heating, Refrigerating, and Air- Conditioning Engineers. It is a global society advancing human well-being through sustainable technology for the built environment. The society and its members focus on building systems, energy efficiency, indoor air quality, refrigeration and sustainability within the industry. Website: www.ashrae.org
ASHRAE 52.1	It is a document describing the evaluation and performance of air filters used in data centres and equipment rooms
ASHRAE TC9.9	Technical Committee for Facility and Equipment Thermal Guidelines for Data Centre and other Data Processing Environments. This is a consortium of IT users and manufacturers creating common guidelines for the standardization, layout, testing and reporting of IT rooms and data centres.
ASME	American Society of Mechanical Engineers
ASME/ANSI B31.5	Refrigeration Piping and Heat Transfer Components Standards
AVD	OSHA Shorthand for Alleged Violation Description
Bands	It is the strapping used to fasten insulation and/or jacketing in place
BD	Piping Identification for Booster Discharge Line
BHP	Brake Horsepower
Bleeder Valve	A Bleeder Valve is a valve used to drain Ammonia from hoses and piping safely
BLEVE	Boiling Liquid Expanding Vapor Explosion
BPCS	Basic Process Control System
BTU	British Thermal Unit (It is equal to about the heat put off by 1 wooden kitchen match). It is a measurement of the amount of heat required to raise or lower the temperature of one pound of water 1°F
BTU/h	British Thermal Units per hour
Burner	It is a device that facilitates the combustion of air and gas.
Burner Orifice	It is the opening in the burner through which the gas or fuel passes prior to combustion
CA	Compliance Audit
CAA	Clean Air Act
CalARP	California Code of Regulation Title 19: California Accidental Release Prevention Program
Capacity	It is the output produced by the heating or cooling unit. It is measured in BTU/hr
CARO	RETA Certification: Certified Assistant Refrigeration Operator

TERMS	DEFINITIONS
CAS Registry Number	A unique number consisting of up to nine digits assigned to a chemical
CBI	EPA Shorthand for Confidential Business Information
CC	Capacity Control
CCF	Common Cause Failure
CCPS	Centre for Chemical Process Safety
CD	Piping Identification for Condensate Drain Line
CDX	Central Data Exchange for the EPA
Ceiling Mount	It is a small precision air conditioner hung from, or suspended above, a ceiling. This type of air conditioner comes in many designs, but usually is connected to a heat rejection unit on an outdoor pad or rooftop via refrigerant or water lines
Cellular Insulation	It is the insulation composed of small, individual cells separated from each other. The cellular material may be glass such as polystyrene, polyurethane, polyisocyanurate, or elastomeric.
Celsius	It is a temperature scale that registers the freezing point of water as 0° and the boiling point as 100° under normal atmospheric pressure.
CEPPO	EPA's Chemical Emergency Preparedness and Prevention Office
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)
Certification	According to 29 CFR 1910, Certification is defined as a written, signed and dated statement confirming the performance of a requirement of this section. 1910.66
CFATS	Department of Homeland Security's Chemical Facilities Anti-Terrorism Standards
CFM	Cubic Feet per Minute. It is a standard of airflow measurement
CFR	Code of Federal Regulation
Charging a System,	it is a term used to describe adding a coolant, or refrigerant, to an HVAC & R system
Check Valve	A Check Valve is a valve that allows flow only in one direction
Chemical	According to 29 CFR 1910, A Chemical is defined as any element, chemical compound or mixture of elements and/or compound. 1910.1200
CHEMNEP	OSHA's Chemical National Emphasis Program
Chilled Water System	It is a type of precision cooling system widely used in mid-sized to large IT environments. A chilled water system uses water as a cooling medium. Cold water is pumped from a chiller to computer room air handlers designed to cool the space. A chilled water air conditioner can be likened to a car radiator with a fan, with hot air being cooled by being blown through a cool radiator. In a chilled water system cooling an IT facility, the chilled water may be provided as a utility in the building, or special dedicated water chillers may be installed

TERMS	DEFINITIONS
Chiller	It is a device used to continuously refrigerate large volumes of water. A chiller uses the refrigeration cycle to produce large volumes of chilled water (typically at 45 48°F / 7-9°C) that is distributed to Computer Room Air Handlers (CRAH) units designed to remove heat from the IT environment
CHSO	Compliance Health and Safety Officer (See also CSHO)
CIRO	RETA Certification: Certified Industrial Refrigeration Operator
Clean room	It is a room that is virtually free of dust or bacteria. It is used in laboratory work and in assembly or repair of precision equipment. Clean rooms usually use precision air conditioning
CMMS	Computerized Maintenance Management Systems
CO	Carbon Monoxide
CO2	Carbon Dioxide
Coating	It is a liquid or semi-liquid that dries or cures to form a protective finish, suitable for application to thermal insulation or other surfaces in a dry thickness of 20 mils or fewer per coat
Coil	The coil, or evaporator coil, is connected to the airflow outlet of the furnace. Conditioned refrigerant is circulated through the coil to cool the structure in the summer and heat in the winter. As warm indoor air passes through the indoor or evaporator coil, temperature and humidity are removed creating cooler indoor air. Installing a correctly sized and rated evaporator coil is essential for getting the highest performance and comfort from your central air conditioning or heat pump system.
Comfort Air Conditioning	Common air conditioning systems designed for the comfort of people. When compared to computer room air conditioning systems, comfort systems typically remove an unacceptable amount of moisture from the space and generally do not have the capability to maintain the temperature and humidity parameters specified for IT rooms and data centres.
Competent	According to 29 CFR 1910, Competent is defined as possessing the skills, knowledge, experience, and judgement to perform assigned tasks or activities satisfactorily as determined by the employer. 1910.120
Compressor	A Compressor is a unit used for compressing vapor to higher pressures. It is the heart or “pump” within an air conditioning, refrigeration or heat pump system
Condenser	A condenser is a unit (usually a heat exchanger) in which heat is transferred from vapor to the outside air in order to condense ammonia into a liquid.
Condensate	As warm air is pulled or pushed across the cool evaporator coil the coil perspires, creating liquid, or condensate which is mechanically drained away from the equipment.
Condenser Coil	Generally, it is the outdoor coil It removes heat from the refrigerant in the summer months, allowing the refrigerant to be converted from vapor to liquid and complete the refrigeration process.

TERMS	DEFINITIONS
Condenser fan	It is a fan that accelerates the movement of air over the condenser coil, facilitating the removal of heat from the refrigerant.
Conductance, Thermal (C-value)	It is the time rate of steady-state heat flow through a unit of a material or construction induced by a unit temperature difference between the body surfaces.
Conduction	It is a mode of heat transfer in which heat energy is transferred within an object itself or between objects in contact. When a cold spoon is left in a pot of boiling water, the spoon eventually becomes hot. This is an example of conduction. Conduction is one of the three forms of heat transfer, which also include Convection and Radiation
Conductivity, Thermal (K-value)	It is the measure of heat that passes through a unit area of a homogenous substance, through a unit thickness, in a unit of time, for each unit temperature difference. The lower the K-value, the higher the insulating value
Convection	It is a mode of heat transfer in which heat energy is transferred from an object to moving fluid such as air, water, or refrigerant. The heat sink of a computer processor is an example of heat transfer by convection
Cooling Tower	It is a heat rejection method that transfers heat energy from a data centre or IT room to the outside atmosphere via the evaporation of water. In a cooling tower, water is sprayed onto a high surface-area packing material as large volumes of air are drawn across through the structure. The net effect of this process is that a small portion of the water circulated through the cooling tower evaporates into the outside atmosphere. The remaining water (now cooler) is collected at the bottom of the cooling tower
Cp	Specific Heat at Constant Pressure. Its English unit is BTU/lb.-°F
Cv	Specific Heat at Constant Volume. Its English unit is BTU/lb.-°F
CPL 02-00-148	OSHA's Field Operations Manual
CPL 02-02-07, Appendix A	OSHA's discussion on the difference between "incidental release and emergency response"
CPL 03-00-014	OSHA's New CHEMNEP Nationwide
CPL 2-2.45A	OSHA's instruction of auditing PSM programs "PQV". It began on September 13th, 1994.
CPR	Vessel identifier for Controlled Pressure Receiver
CQ	Shorthand for Contractor's Qualifications
CR	Compression Ratio

TERMS	DEFINITIONS
CRAC	Computer Room Air Conditioning Unit. It is a device usually installed in the data centre that uses a self- contained refrigeration cycle to remove heat from the room and send it away from the data centre through a kind of cooling medium via piping. It must be used with a heat rejection system which then transfers the heat from the data centre into the environment. The heat rejection system typically takes one of the following forms: condensing unit, fluid cooler, or cooling tower to discharge heat to the outdoor atmosphere
CRAH	Computer Room air Handling Unit. It is a device usually installed in the data centre or IT room that uses circulating chilled water to remove heat. It must be used in conjunction with a chiller
CSA	Canada Standards Association
CSAT	Department of Homeland Security's Chemical Security Assessment Tool
CSB	United States Chemical Safety Board
CSHO	Compliance Safety and Health Officer (See also CHSO)
CSC	Car Sealed Closed. A valve sealed in the closed position
CSO	Car Sealed Open. A valve sealed in the open position
CVI	Department of Homeland Security's "Chemical-terrorism Vulnerability Information"
Damper	A Damper is a valve for controlling airflow. It is found at the junction point of ductwork; movable plate opens and closes to control airflow. It can be manually or automatically controlled to regulate airflow to desired system zones
DC	Piping Identification for Defrost Condensate Line
DC	It is a type of electrical current that only flows in one direction.
Degree-Day	It is evaluated by subtracting the average outdoor temperature for an area from 65°F. This measurement is used to estimate the amount of heating or cooling a home or building will need.
Dehumidifier	It is a device that removes humidity, or moisture, from the air Demonstration According to 29 CFR 1910,
Demonstration	is defined as the showing by actual use of equipment or procedure. 1910.120
DEP	Directorate of Enforcement Programs or Department of Environmental Protection
Design Condition	It consists of the desired properties for an environment expressed in dry bulb temperature, wet bulb temperature and relative humidity. Cooling equipment manufacturers normally published performance data of air conditioning systems at several design conditions
Dew Point	It is the temperature at which water vapor begins to condense. On a hot summer day, a cold soda can is below the dew point which causes condensation on the surface of the can.
DHS	US Department of Homeland Security
Diffuser	It is a grille over an air supply duct with vanes that distribute the discharging air in a specific pattern or direction

TERMS	DEFINITIONS
DOE	Department of Energy. Website: www.energy.gov
DOT	US Department of Transportation
Downflow Furnace	It is a furnace with an intake on the top and an air discharge at the bottom
DQC	Document Quality Control Drain Pan It is also referred to as a condensate pan. As vapor condenses, the drain pan collects the condensate and channels it to the drain line
Dry Bulb, Temperature	It is the temperature measured without considering the humidity.
Ductwork	Ductwork consists of round or rectangular pipes or controlled paths acting as a conduit for return, mixed, makeup, supply or exhaust air. Supply air is downstream of high pressure side of fan while the Return air is upstream of low-pressure inlet of fan
DX	Direct Expansion Evaporator. It is a general term applied to air conditioning systems that have a self-contained refrigeration system and are air, glycol or water-cooled.
EAP	Emergency Action Plan 29 CFR 1910.38
EAS	Employee Alarm System
Economizer	The term is used to describe a mechanism that removes flash gas from the evaporator Education According to 29 CFR 1910,
Education	is defined as the process of imparting knowledge or skill through systematic instruction. It does not require formal classroom instruction. 1910.155
EE	OSHA shorthand for Employee (It is common in citations)
EER	Energy Efficiency Ratio. It is the ratio of the output cooling energy (in BTU) to input electrical energy at a given operating point.
EHHC	Extremely Highly Hazardous Chemical
Energy Star®	ENERGY STAR is a U.S. Environmental Protection Agency (EPA) voluntary program that helps businesses and individuals save money and protect our climate through superior energy efficiency. Website:www.energystar.gov
Enthalpy	It is the total quantity of energy used to heat or cool a substance between two temperatures including the energy used to change the state of the substance if applicable. For example, if we heat a sample of water at normal atmospheric pressure from 33°F to 275°F (1°C to 135°C), the enthalpy is the sum of the sensible heat energy added (from 33°F / 1°C to 212°F / 100°C and from 212°F / 100°C to 275°F / 135°C) and the latent heat energy added (state change from liquid to vapor at 212°F / 100°C)
EOP	Emergency Operational Procedure
EP	Employee Participation
EPA	Environmental Protection Agency. It is an agency of the U.S. federal government which was created for the purpose of protecting human health and the environment by writing and enforcing regulations based on laws passed by Congress. Website: www.epa.gov

TERMS	DEFINITIONS
EPCRA	Emergency Planning and Community Right-to-Know Act
EQ	Piping Identification for Equalizer Line
ER	Emergency Response, also OSHA shorthand for Employer (It is common in citations)
ES	Piping Identification for Economizer Suction Line
ESP	Emergency Shutdown Procedure
Evaporator	An Evaporator is a unit designed to vaporize liquid refrigerant, thus cooling the air by absorbing heat
Evaporator coil	It is also known as an indoor coil. It is a device designed to absorb heat in the air in order to change the liquid refrigerant that flows through it into a vapor initiating the cooling process.
EX	Exhaust Air
Expansion Valve	It is a valve that meters the levels of refrigerant through a temperature or pressure control
F-Rating	It is a rating usually expressed in hours, indicating a specific length of time that a fire-resistive barrier can withstand fire before being consumed or permitting the passage of flame through an opening in the assembly, as determined by ASTM E 814 (UL 1479)
Facing	It is a thin covering adhered to the surface of insulation prior to field installation
Fahrenheit Scale	It is a scale for temperature with its units in “°F”. On a Fahrenheit thermometer, under standard atmospheric pressure, boiling point of NH3 is -28°F while the freezing point is -107.9°F. Whereas, that of water is 212°F and 32°F respectively.
Fan	It is a device consisting of motor and a blower wheel that creates airflow.
FAR	Fatal Accident Rate
Fibrous Insulation	It is the insulation composed of small-diameter fibers that finely divide the air space. Fibers used are silica, rock wool, slag wool, or alumina silica
Film (Wet)	It is the applied layer of mastic or coating before curing or drying
Filter	A central heating and cooling system may use multiple filters. The air filter is integral to the system intake ducting, prevents contaminants from entering the equipment and must be maintained or replaced at regular intervals. There is also a filter in the refrigeration system, also referred to as a drier, which acts like a strainer to remove dirt and undesired particles from the system.
Finish	It is the texture of a metal surface. Finishes include jackets, mastics, or strong films used for aesthetics or to protect insulation from 1 or more of the following: weather, mechanical and/or personnel abuse
Flash	It is a term used to describe the change in state of refrigerant from a liquid to a vapor inside the expansion valve and evaporator coil of a room air conditioning unit
Flow Regulator	A Flow Regulator is a controlling device which regulates the flow of liquid in a pipe

TERMS	DEFINITIONS
Fluid Regulating Valve	It is a device, often controlled by an electric motor, to regulate the flow of water or glycol through the coil and/or heat exchanger in a computer room air conditioner or air hand
FMEA	Failure Mode Effects Analysis
Flue	It is a vent that removes the byproducts of combustion from furnace
FOM	OSHA's Field Operations Manual
FR	Piping Identification for Flooded Return Line
Freon	It is a generic term applied to several types of refrigerants commonly found in an air conditioning system
FS	Piping Identification for Flooded Supply Line
Fully Ducted, Distribution	It is an air distribution or return methodology in which air is directly ducted into or out of the loads
Furnace	It is a device that facilitates the combustion of fuel and air to create heat and then circulates it through the home by means of a fan. It is the major gas fired component for heating a home.
Fuse	It is a delicate metal strip connecting two parts of an electrical circuit. This strip works as a safety, or circuit protector, and breaks, or melts, in the event of excess electrical charge, breaking the electrical circuit.
GAMA	Gas Appliance Manufacturers Association
Gauge	It is a device used to measure pressures below atmospheric pressure
Gauge Manifold	It is a device constructed to hold compound and high-pressure gauges containing hand valves to control flow
GCAP	Garden City Ammonia Program
Granular Insulation	It is the insulation composed of small nodules that contain voids or hollow spaces. The materials may be calcium silicate, diatomaceous earth, expanded vermiculite, perlite, cellulose, or microporous insulations.
Hands-on-Training	According to 29 CFR 1910, Hands-on-Training is defined as the training in simulated work environment that permits each student to have experience performing tasks, making decisions, or using equipment appropriate to the job assignment for which the training is being conducted. 1910.120
HAZCOM	Hazard Communication 29 CFR 1910.1200
HazOp	Hazard and Operability Study
HAZWOPER	Hazardous Waste Operations and Emergency Response 29 CFR 1910.120
Head Pressure	It is the pressure which exists in the condensing side of a refrigerating system

TERMS	DEFINITIONS
Head Pressure Control	It is the pressure operated control which opens electrical circuit if high side pressure becomes excessive
Head, Static	It is the pressure of fluid expressed in terms of height of column of the fluid, such as water or mercury
Head, Velocity	In flowing fluid, height of fluid is equivalent to its velocity pressure.
Heat Exchanger	It is a device for the transfer of heat energy from the source to the conveying medium.
Heat Gain	It is the amount of heat added or created in a designated area
Heating Coil	It is a coil that acts as a heat source for a heating system
Heat Loss	It is the amount of heat subtracted or lost from a designated area
Heat Pump	It is a device used for either the heating or cooling of a space by transferring heat between two reservoirs
Heat Transfer	It is the flow of heat from one area to another by conduction, convection, and/or radiation. Heat flows naturally from a warmer to a cooler material or space.
HEV	Hand Expansion Valve (also referred to as HXV)
HG	Piping Identification for Hot Gas Line
HGD	Piping Identification for Hot Gas Defrost Line (also referred to as Hot Gas Discharge)
HHC	Highly Hazardous Chemical
Housekeeping	According to 29 CFR 1910, Housekeeping is defined as the process of keeping the storage areas free from accumulation of materials that constitute hazards from tripping, fire, explosion, or pest harbourage. Vegetation control will be exercised when necessary. 1910.176
HPL	Piping Identification for High Pressure Liquid Line
HPR	High Pressure Receiver
HSD	Piping Identification for High Stage Discharge Line
HSPF	Heating Seasonal Performance Factor. It is a term specifically used to define the measurement of efficiency of residential heat pump system
HSS	Piping Identification for High Stage Suction Line
HTHM	High Toxic Hazardous Material
HTL	Piping Identification for High Temperature Liquid Line
HTRL	Piping Identification for High Temperature Recirculated Suction Line
HTS	Piping Identification for High Temperature Suction Line
HV	Hand Shutoff Valve or Hand Valve
HVAC	Heating, Ventilation and Air Conditioning. Sometimes an “R” is shown at the end to represent Refrigeration.

TERMS	DEFINITIONS
Humidifier	It is a device that adds humidity, or moisture, to the air
Humidistat	It is a device that measures humidity and turns the humidifier on and off
Humidity	It is the dampness in the air caused by water vapor
HWP	Hot Work Permit
HXV	Hand Expansion Valve (also referred to as HEV)
IAR	Industrial Ammonia Refrigeration Operators National Standard
IARW	International Association of Refrigerated Warehouses
IDLH	Immediately Dangerous to Life and Health.
IEBC	It was set forth by OSHA at 300 ppm for Ammonia International Existing Building Code
IECC	International Energy Conservation Code
IEEE	Institute for Electrical and Electronic Engineers
IFC	International Fire Code
IFGC	Ignition International Fuel Gas Code It is the process of increasing the temperature of a substance to the point of causing a combustive reaction.
IHI	Individual Hazard Index
II	Incident Investigation
IIAR	International Institute for Ammonia Refrigeration
IIAR Bulletin 107	Suggested Safety and Operating Procedures when making Ammonia Refrigeration Tie-ins
IIAR Bulletin 108	Water Contamination in Ammonia Refrigeration Systems
IIAR Bulletin 109	IIAR Minimum Safety Criteria for Ammonia Refrigeration Systems
IIAR Bulletin 110	IIAR Guidelines for: Startup, Inspection, and Maintenance of Ammonia Mechanical and Refrigeration Systems
IIAR Bulletin 111	Guidelines for: Ammonia Machinery Room Ventilation
IIAR Bulletin 112	Ammonia Machinery Room Design
IIAR Bulletin 114	Guidelines for: Identification of Ammonia Refrigeration Piping and System Components
IIAR Bulletin 116	Guidelines for: Avoiding Component Failure in Industrial Refrigeration Systems Caused by Abnormal Pressure or Shock
IIR	International Institute of Refrigeration
IMC	International Mechanical Code
Induction Motor	It is an AC motor which operates on the principle of rotating magnetic field. Rotor has no electrical connection but receives electrical energy by transformer action from field windings.

TERMS	DEFINITIONS
Interconnection, Agreement	It is a connection or link between power systems that enables them to draw on each other's reserve capacity in time of need.
Intercooler	An Intercooler is the immediate vessel between the high stage and low stage in a multistage
IOMs	system Installation, Operation, and Maintenance Manuals ISA
ISO	Instrument Society of America International Standards Organization
ISO 14000	Standards published by the International Organization for Standardization for establishing environmental management systems
ISO 9000 ISP	Standards published by the International Organization for Standardization for quality management systems Initial Startup Procedure
ITMP	Inspection, Testing and Maintenance Procedures
Jacket	It is a protective covering installed over thermal insulation
Junction Box	A Junction box consists of a group of electrical terminals housed in protective box or container
Kaizen	It refers to a quality system using lessons learned- continuous improvement.
kW	Kilowatt. It is equal to 1000 watts
L	Likelihood Column of a What If/Checklist of a PHA
L/T	L2F Lockout/Tagout (sometimes represented as LO/TO)
L2F	Letter to File
L3RMP	EPA's Level 3 Risk Management Plan Checklist Audit
Lagging- Insulation	It is a block material for insulating tanks or boilers, pipe, ducts, vessels or other mechanical equipment usually curved or tapered. It can be made from any of several insulation materials. Lagging insulation is usually applied in the form of cut, pieced together, or mitered parts
Lagging- Jacketing	It is the jacketing installed over insulation
Latent Heat	It is the energy released or absorbed, by a body or a thermodynamic system, during a constant-temperature process that creates a change of state. An example is the latent heat of vaporization which creates a phase transition from liquid to a vapor at a specified temperature and pressure
Leak Detector	It is a device, or an instrument used to detect leaks
LEL	Lower Explosive Limit: For Ammonia 15% or 150,000 ppm
LEPC	Local Emergency Planning Commission Lessons Learned Applying knowledge gained from past incidents in current practices
LFL	Lower Flammability Limit: For Ammonia 15% or 150,000 ppm
LIC	Piping Identification for Liquid Injection Cooling Line

TERMS	DEFINITIONS
Locally Ducted, Distribution	It is an air distribution or return methodology in which air is provided or returned via ducts which have vents located near the loads
LOPA	Layer of Protection Analysis
LO/TO	Lockout/Tagout (sometimes represented as L/T)
LPR	Low Pressure Receiver
Lps	Liters per second. It is used to measure the flow of air through a delivery system or space. It is the metric equivalent of CFM
LSD	Piping Identification for Low Stage Discharge Line
LSS	Piping Identification for Low Stage Suction Line
LT	Piping Identification for Liquid Transfer Line
LTL	Piping Identification for Low Temperature Liquid Line
LTRL	Piping Identification for Low Temperature Recirculated Liquid Line
LTRS	Piping Identification for Low Temperature Recirculated Suction Line
LTS	Piping Identification for Low Temperature Suction Line
Machine Room	A Machine room is a room or space designed to safely house compressors and pressure vessels
Make-Up Air	It is the outside air introduced into the IT room or data centre. Make-up air is mandated by building codes primarily to ensure the space is fit for human occupancy
Manufacturer, Approved System	If replacing a condensing unit, furnace or air handler, the system must be manufacturer approved and Air Conditioning, Heating and Refrigeration Institute (AHRI) matched. **NOTE:** Installation of unmatched systems is strongly discouraged.
Mastic	It is a protective coating applied by spray or trowel to weatherproof or otherwise prevent deterioration of the insulation to which it is applied
MAWP	Maximum Allowable Working Pressure
MDMT	Material Design Minimum Temperature
Mean Temperature	It is the sum of the cold surface temperature and the hot surface temperature, divided by 2. Mean temperatures are used to calculate thermal conductivities.
Media	It is the fine material of a filter that traps dirt, dust, mildew or bacteria
MI	Mechanical Integrity

TERMS	DEFINITIONS
Microprocessor, Controller	It is a computer logic-based system found in precision cooling systems that monitors, controls and reports data on temperature, humidity, component performance, maintenance requirements and component failure
MII	Maximum Intended Inventory
MOC	Management of Change
Moisture Barrier	It is a polymeric film or coating applied to the inner surface of metal jacketing for the primary purpose of reducing electrolytic, pitting, or crevice corrosion of the jacketing. They are not water vapor barriers or water vapor retarders
Moisture Retarder	It is a layer of plastic film or other material applied to the inner side of metal jacketing to inhibit jacket corrosion by interfering with the formation of a galvanic cell between the dissimilar metals of the pipe and jacket or preventing crevice corrosion. It is not an insulation system water vapor retarder and does not perform the same function
MRTL	Piping Identification for Medium Temperature Recirculated Liquid Line
MRTS	Piping Identification for Medium Temperature Recirculated Suction Line
MSDS	Material Safety Data Sheet
MTL	Piping Identification for Medium Temperature Liquid Line
MTS	Piping Identification for Medium Temperature Suction Line
N.C or NC	Normally Closed
N.O or NO	Normally Open
NAICS	North American Industrial Classification System
NATE	North American Technician Excellence. It is the nation's largest non-profit certification organization for heating, ventilation, air conditioning and refrigeration technician. NATE is the only technician certification organization governed, owned, operated, developed and supported by the HVACR industry. Website: www.natex.org
NBIC	National Board Inspection Code
NDT	Non-Destructive Testing, usually of material thickness
NEC	National Energy Council/ National Electric Code
NEMA	National Electrical Manufacturing Association
NEP	National Emphasis Program Audit, usually a Chemical NEP for our industry
NFPA	National Fire Protection Association
NFPA 471	Recommended Practice for Responding to Hazardous Material Incidents
NFPA 472	Standard for Professional Competence of Responders to Hazardous Material Incidents
NH3	Chemical symbol for Ammonia, one Nitrogen and three Hydrogen atoms

TERMS	DEFINITIONS
NIOSH	National Institute for Occupational Safety and Health
NO	OSHA's National Office
NOP	Normal Operational Procedure
NRC	National Report Centre
NSP	Normal Shutdown Procedure
OC	Piping Identification for Oil Charge Line
OCWR	Piping Identification for Oil Cooling Water Return Line
OCWS	Piping Identification for Oil Cooling Water Supply Line
OD	Piping Identification for Oil Drain Line
ODS	Ozone Depleting Substance
OP	Operating Procedures
Operator	An Operator is an individual responsible for monitoring, controlling, and performing tasks as necessary to accomplish the productive activities of a system. The term is often used in a generic sense to include people who perform all kinds of tasks (e.g., reading, calibration, maintenance).
Orifice	An opening or hole
OSHA	Occupational Safety and Health Administration
P&IDs	Piping and Instrumentation Diagrams
Package Unit	It is a heating and cooling system contained in one outdoor or indoor unit.
Particulates	It is made up of the fine liquid or solid particles contained in combustion gases. The quantity and size of particulates emitted by cars, power and industrial plants, wood stoves, etc. are regulated by the U.S. EPA
PD	Pressure Difference
PEL	Permissible Exposure Limit set forth by OSHA at 50 ppm for Ammonia
PFD	Process Flow Diagram (or less likely- Probability of Failure on Demand)
PFFM	Process Flow Failure Mode
PHA	Process Hazard Analysis
PID	Proportional Integral and Derivative
PLC	Programmable Logic Controller System
Plenum	It is a pressurized space containing a gas (typically air) at positive pressure (pressure higher than surroundings). One function of the plenum is to manage and equalize pressure for more even distribution

TERMS	DEFINITIONS
Plenum Rating	It is a special characteristic of electrical and communication wiring that is used in spaces used to transport conditioned supply or return air. Plenum rated cables have lower flammability and heat release characteristics than standard cables
PM	Preventive Maintenance
PO	Piping Identification for Pump Out Line
Power Density	It is the electrical power used in a space divided by the area of the space
PPB	Parts Per Billion
PPE	Personal Protective Equipment
PPM	Parts Per Million
PQV	Program Quality Verification Audit, OSHA's CPL 2-2.45a
PRCS	Permit Required Confined Space
Pressure Vessel	A Pressure Vessel is nay receptacle containing refrigerant under pressure
PRG	Piping Identification for Purge Line (sometimes referred to as PL)
Programmable, Thermostat	It is a type of thermostat that allows the user to program into the devices' memory a pre-set schedule of times and temperatures enabling or disabling the HVAC equipment.
PRV	Pressure Relief Valve (sometimes referred to as PSV)
PSI	Process Safety Information
PSI	Pound per Square Inch. It is a unit of pressure resulting from the force of one pound-force applied to an area of one-square inch
PSIA	Pounds Per Square Inch Absolute Pressure. It is used to clarify that the pressure is relative to a vacuum rather than the ambient atmospheric pressure. Since atmospheric pressure at sea level is about 14.7 psi, this will be added to any pressure reading made in air at sea level.
PSIG	Pounds Per Square Inch Gauge Pressure. It indicates that the pressure is relative to atmospheric pressure
PSM	OSHA's Process Safety Management Program required under 1910.119
PSM/RMP	Process Safety Management and Risk Management Programs combined as a Unified Program
PSS	Process Safety System
PSV	Pressure Safety Valve (sometimes referred to PRV)
PSSR	Pre-Startup Safety Review

TERMS	DEFINITIONS
Psychometric	It is the analysis of the atmospheric conditions, particularly moisture in the air Psychometric Chart It is a chart containing the properties of air and the water at different temperatures arranged in the form of a chart. It shows the quantitative interdependence between temperature and humidity. It is useful in the planning, specification and monitoring of cooling systems
PVC	Polyvinyl Chloride. It is a type of plastic
QA	Quality Assurance
Qualified Person	According to 29 CFR 1910, A Qualified Person is a person with specific training, knowledge, and experience in the area for which the person has the responsibility and authority to control. 1910.120
R	Risk Column of a What If/Checklist of a PHA
R717	Ammonia- a pungent, colorless gas
RA	OSHA's Regional Administrator
Radiant Floor	It is a type of radiant heating system where the building floor contains channels or tubes through which hot fluids such as air or water are circulated
Radiation	It is a mode of heat transfer through matter or space by means of electromagnetic waves.
RAGAGEP	Recognized and Generally Accepted Good Engineering Practices or Principles
RC	Piping Identification for Receiver Charge Line
Receiver	A Receiver is a vessel permanently connected to a refrigeration system of liquid Ammonia
Reciprocating, Compressor	It is a compressor used in cooling systems to compress refrigerant by using a piston action
Refrigerant	Refrigerant Charge It is a substance that produces a cooling (i.e., heat absorbing) effect while expanding or vaporizing
Refrigerant	It is the amount of refrigerant in a system
Refrigerant Destruction	A recovered ODS refrigerant can be sent for destruction to a facility that can achieve the destruction efficiencies required by regulations under the Clean Air Act or the Resource Conservation and Recovery Act (RCRA)
Refrigerant, Hazardous Waste	CFC refrigerants that will be reclaimed for further use are eligible for an exemption from federal hazardous waste regulation in 40 CFR 261.4(b)(12). CFC refrigerants that cannot be reclaimed must be evaluated to determine if they exhibit any of the characteristics of a hazardous waste (i.e., ignitability, corrosivity, reactivity, and toxicity)
Refrigerant Recycling	This involves recovering the refrigerants for reuse within the same system or another system operated by the same owner. Recycling may involve using EPA-approved equipment to clean refrigerants for reuse, but not to the same standards as reclamation

TERMS	DEFINITIONS
Refrigeration	It is the process of moving heat from an undesirable location to a location where it is more desirable
Refrigeration Cycle	It is a closed cycle of evaporation, compression and condensation that has the net effect of moving heat energy away from an environment and into another environment. Refrigerant changes its physical state from liquid to gas and back to liquid again each time it traverses the various components. As the refrigerant changes state from liquid to gas, heat energy flows into the refrigerant from area to be cooled (the IT environment for example). Conversely, as the refrigerant changes state from gas to liquid heat energy flows away from the refrigerant to a different environment (outdoors or to a water source).
Resistance,	
Thermal (R-value)	It is a measure of the ability to retard heat flow rather than the ability to transmit heat. R-value is the numerical reciprocal of “U” or “C”, thus R = 1/U or 1/C. Thermal resistance, R-value, is used in combination with numerals to designate thermal resistance values: R-11 equals 11 resistance units. The higher the “R”, the higher the insulating value. The I-P units are °F – ft2-hr/Btu while the SI units are °C-m2/W
Resistivity,	
Thermal, r	It is the quantity determined by the temperature difference, at steady state, between two defined parallel surfaces of a homogenous material of unit thickness, that induces a unit heat flow rate through a unit area. The Inch-Pound units are h ft F/Btu or, h ft2F/Btu in. while the SI units are mK/W
RESOP	Refrigerating Equipment Standard Operating Procedure
RETA	Refrigerating Engineers and Technicians Association
Return Air	It is the air entering an air conditioning system
RMP	Risk Management Plan or Risk Management Program. The Plan is what is filed with the EPA, while the Program is all the things necessary to implement the Plan
RMT	Refrigeration Management Team RO OSHA’s Regional Office
ROSOP	Refrigerating Operations Standard Operating Procedure RP Respiratory Protection
RQ	Reportable Quantity
RR	Recirculation Ratio
RSM	Refrigeration Safety Management Program
RTK	Right to Know
RV	Piping Identification for Relief Vent Line
S	Severity Column of a What IF/Checklist of a PHA
SAF	Supply Air Fan

TERMS	DEFINITIONS
Safety Control	It is a device used to electrically shut down a refrigerating unit when unsafe pressures and/or temperature exist
Safety Motor Control	It is an electrical device used to open circuit if the temperature, pressure, and/or the current flow exceed safe conditions
Safety Plug	It is a device which releases the contents of a container above normal pressures, and before rupture pressures are reached.
SAT	Saturated Refrigerant
Saturated Temperature	It is the temperature at which the refrigerant exists in both liquid and vapor forms relative to its pressure
SAT Charts	Saturation Table or Charts
SC	Sub-Cooled Liquid Refrigerant
SCBA	Self-Contained Breathing Apparatus
SCL	Piping Identification for Sub-Cooled Liquid Line
Scroll Compressor	It is type of compressor used both in lower and higher efficiency air conditioners. They are popular because they feature fewer moving parts than reciprocating compressors. This translates to more efficient operation, higher tolerance to liquid refrigerant, less mechanical failure and smoother, quieter operation.
Sealant	In insulation, they function primarily as water and vapor seals. They may also be used as adhesives and for expansion joints for metal, masonry, cellular glass, etc. they must exhibit low shrinkage, excellent adhesion, and permanent flexibility
Sealer	It is a liquid coating used to prevent excessive absorption of finish coats into porous surfaces
Securement	It is any device, wire, strap, or adhesive used to fasten insulation into its service position and hold it there
SEER	Seasonal Energy Efficiency Ratio. It is defined by the Air Conditioning, Heating, and Refrigeration Institute as the cooling output during a typical cooling-season divided by the total electric energy input during the same period.
Self-contained System	It is a package unit Sensible Heat It is the heat added or removed that causes a change in temperature Sensor It is a device that reacts to a change in conditions
SERC	State Emergency Response Commission
Service,	
Temperature Limits	It is the temperature to which the jacket or coating may be subjected when applied over insulation. It does not refer to the operating temperature of the equipment, vessel, or pipe
Set Point	It is the user-set or automatic thresholds for heating, cooling, humidification, and dehumidification usually measured in the return air stream of the computer room air conditioner or air handler.

TERMS	DEFINITIONS
SH	Superheated Refrigerant
Single-Speed	A single-speed motor runs at top speed until it satisfies your temperature setting and then shuts off. They are generally louder at start-up, consume more energy than alternative motor types and can cause more stress on mechanical parts
Solenoid Valve	A Solenoid valve is a valve actuated by magnetic action by means of an electrically energized coil
SOP	Standard Operating Procedure
SPD	Surge Protective Device. It is a device composed of at least one non-linear component and intended for limiting surge voltages on equipment by diverting or limiting surge current and it can repeat these functions as specified. SPDs were formerly referred to as Transient Voltage Surge Suppressors or secondary surge suppressors.
Specific Heat	It is a term used to describe the relative capabilities of refrigerants and other fluids to transport heat energy. Defined as the quantity of heat required to raise the temperature of a unit mass of a substance one degree
Split System	It is an outdoor unit combined with an indoor unit (as opposed to a package unit), generally providing more efficiency and configuration options
SST	Site-Specific Targeting Plan
Standard	According to 29 CFR 1910, Standard is defined as a standard which requires conditions, or the adoption or use of one or more practices, means, methods, operations, or processes, reasonably necessary or appropriate to provide safe or healthful employment and places of employment
STEL	Short Term Exposure Limit
Stop valve	A Stop valve is a valve used to shut off the flow of Ammonia or any other fluid in a pipe
Supply Air	It is the air entering a space from an air conditioner, that is, the air leaving the air conditioning unit.
TD	Temperature Difference
TEV	Automatic Thermostatic Expansion Valve. It is a device that creates a constant evaporator temperature by the regulation of refrigerant flow through the system.
Thermal Capacity	It is the quantity of heat required to change the temperature of the body of 1°. For a homogenous body, it is the product of mass and specific heat. For a non homogenous body, it is the sum of the products of mass and specific heats of the individual constituents
Thermal Properties, of Insulation	They are usually expressed as C-value, K-value, R-value and U-value
Thermostat	It is a wall mounted device that monitors and controls the output of an HVAC system
TML	Thickness Measuring Location

TERMS	DEFINITIONS
TON	A Ton is a unit of measurement used for determining cooling capacity. One Ton is equivalent to 12,000 BTU per hour
TOP	Temporary Operational Procedure
Transmittance, Thermal (U-value)	It is the combined thermal value of all the materials in an insulation system, air spaces, and surface air films. The heat transmission in unit time area of a material or construction and boundary air films induced by unit temperature difference between the environments on each side. The I-P units are Btu/ (hr-ft2-°F temp difference) while the SI units are W/(m2- °C temp difference)
TRI	Toxic Release Inventory
TSR	Piping Identification for Thermosyphon Return Line
TSS	Piping Identification for Thermosyphon Supply Line
Turning Vane	It is an air management device installed in many floor stands to assist in redirecting the flow of cooling air from vertical to horizontal as it exits the computer room air conditioner or air handler
TWA	Time Weighted Average
Two-Speed	The base required for a high-efficiency air conditioner, two-speed motors cycle on in low gear and attempts to satisfy the cooling load for the home, shifting to high gear if necessary. Once it reaches the desired temperature, it cycles back down to low before shutting off. With just two speeds, it reduces start-up noise, operates with greater energy efficiency and causes less stress on mechanical parts compared to single-speed motors
TXV	Manual Thermostatic Expansion Valve (sometimes referred to as TEV). It is a metering valve which functions as a superheat controller.
U1-A's	Manufacturer's Data Report for Pressure Vessels – National Board
UEL	Upper Explosive Limit: For Ammonia 28% or 280,000 ppm
UFL	Upper Flammability Limit: For Ammonia 28% or 280,000 ppm
UMC	Uniform Mechanical Code
UP	Unified Program – Combining the PSM and the RMP Programs
Upflow Furnace	It is a furnace that pulls in air from the bottom and releases it through the top
Vacuum	It is a space where the pressure is significantly below that of the standards atmospheric pressure
Variable Speed	Ideal for high-efficiency air conditioners, a variable speed motor functions much like a two speed, only with several speeds of operation. When compared with single- or two-speed motors, it facilitates smoother cycling and more precise performance control, as well as the quietest operation, highest energy efficiency and least stress on mechanical parts.

TERMS	DEFINITIONS
Vapor Barrier	It consists of paints, plastic sheeting, floor or ceiling material specifically designed to minimize the migration of humidity into or out of an IT room or data centre
VE	Volumetric Efficiency
Ventilation	The process of moving air (changing) into and out of an interior space either by mechanically induced (forced) means
Volt	It is the derived unit for electrical potential and electromotive force
Voltage	It is the force pushing electrical current along wires and cables
Water Absorption	It is the increase of a material expressed as a percentage of its dry weight or volume after immersion in water for a specified time
Water Vapor, Permeability	It is the time rate of water vapor transmission through unit area of flat material of unit thickness induced by unit vapor pressure difference between 2 specific surfaces under specified temperature and humidity. Water vapor permeability is measured in the ingress protection (IP) system in perm inches
Water Vapor Pressure	it is the pressure of water vapor at a given temperature. It is also the component of atmospheric pressure contributed by the presence of water vapor
Water Vapor Resistance	It is the steady-state vapor pressure difference that induces unit time rate of vapor flow through unit area and unit thickness of a flat material (or construction that acts like homogenous body) for specific conditions of temperature and relative humidity at each surface
Water Vapor, Retarder (Barrier)	It is a material or system that significantly impedes the transmission of water vapor under specified conditions
Water Vapor, Retarder (Jacket)	It is any material or composite meeting the requirements of a water vapor retarder and used for the jacketing of insulation material. It may be factory furnished or field applied and may or may not be adhered to the insulation material
Water Vapor, Transmission Rate, (WVTR)	It is the steady-state water vapor flow in unit time through unit area of a body, normal to specific parallel surfaces, under specific conditions of temperature and humidity at each surface. The I-P units are lbs. / hr – ft2; the SI units are g/ hr – m2.
Watt	It is defined as joule per second and can be used to express the rate of energy transformation with respect to time

TERMS	DEFINITIONS
WCS	Worst Case Scenario
Weather/ Vapor	,
Retarder (Barrier)	It is a vapor retarder that also protects from atmospheric conditions.
Wet Bulb	A Wet Bulb is a device used to measure relative humidity. The evaporation of moisture reduces the temperature of wet bulb compared to dry bulb temperature in the same area
Wet Bulb Thermometer	It is a thermometer that measures the relative humidity in the air
Working Fluid	It is the gas or liquid used to transport heat. In an air conditioning system, the working fluid is the refrigerant. In the data center or IT room itself, air is the working fluid used to transport heat energy away from the IT equipment
WFLO	World Food Logistics Organization
WO	Work Orders
Zoning	It is a system that divides a home, office or space into different regions in order to better control the temperature and effectiveness of a heating and cooling system