6. HYDROGEN SAFETY PLAN

1. Scope of Work for the Safety Plan

Air Products is the primary designer, builder, and installer of the hydrogen fueling equipment. However, there will be several partners and vendors involved with the project. Air Products understands the importance of these partners and vendors to work together, particularly with regard to safety, and we have a commitment to make sure that the respective safety programs of each participant are integrated for a cohesive approach to safety.

There are two major aspects to the project scope:

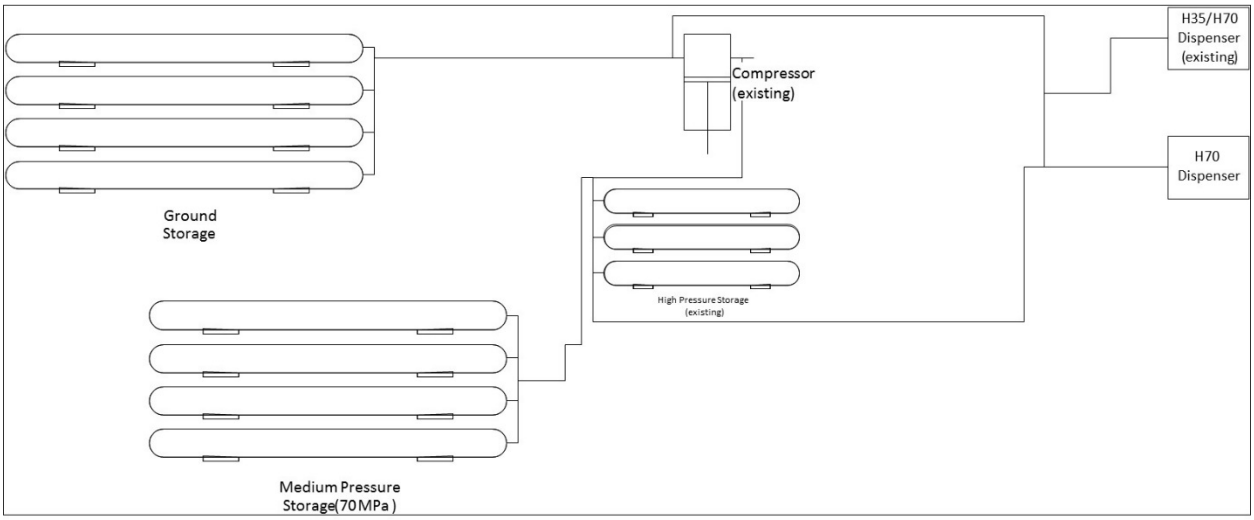
1. Major Equipment – Air Products' equipment scope of supply for the proposed station upgrade consists of the following equipment:

- **Ground Storage:** A ground storage module will be installed to replace the delivery trailer that is dropped and swapped on a periodic basis.

- **Medium Pressure Storage:** A module of medium pressure storage (design pressure of 70 MPa) will store hydrogen supplied from the 70 MPa compression system during times when the light-duty vehicle demand is low (such as overnight).

- **H70 Dispenser:** A second automated retail dispenser (with a single H70 nozzle) will be added to the existing H53/H70 dispenser to provide multiple dispensing points at the same location.

A process flow diagram for the proposed upgrade is provided.



2. Installation – Air Products will design, procure and build the equipment, hire a contractor to perform the site design, complete the permitting process, hire a contractor to perform site-related civil and electrical work, deliver, install and set the equipment, commission and start up the upgraded station.

Commissioning includes an operational readiness inspection, functional testing and training of UCI personnel.

The scope of this project is very similar to that of 10 previous fuel stations that are in the process of being deployed under two awards from the California Energy Commission. At the time of this writing, 6 of the 10 stations this scope of work have been deployed over the previous 24 months under this scope of work and are currently in operation.

2. Organizational Safety Information

2.A Organizational Policies and Procedures

Air Products is an industry leader in hydrogen fuel station technology and hydrogen process safety engineering. Air Products has dedicated teams for both the Engineering and Operations support of hydrogen fueling stations. These teams collectively have over 100 years of hydrogen fueling station experience and over 200 years of experience building, installing and operating industrial hydrogen systems. Resumes and organizational charts can be provided upon request.

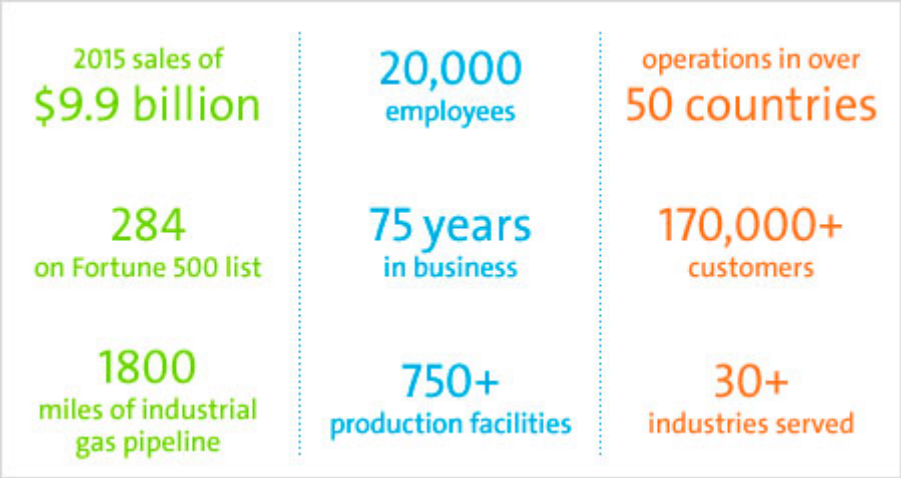
This hydrogen fueling station project will be supported and managed by these experienced teams. In addition, Air Products has a matrix support organization for engineering disciplines that are not directly within the dedicated teams. These include metallurgical engineers, fracture mechanics engineers, reliability engineers, etc.

Fuel stations and new hydrogen equipment/technologies are also reviewed as required by corporate policy by a Corporate Risk Review process. This process is managed by our Process Safety department and ensures that appropriate reviews are conducted to meet corporate risk and safety metrics. The Chief Engineer's office provides much of this technical support and advice.

The following key experiences uniquely qualify Air Products to supply hydrogen related services:

- Industry leader in hydrogen safety engineering
- Global leader in merchant hydrogen production, distribution and supply (- >5.0 million kg per day H_2 production)
- Expert in hydrogen and hydrogen/natural gas refueling station design and installation
- Commercial developer, supplier and operator of turnkey hydrogen production on-site plants
- Air Products is a world leader in hydrogen safety and engineering, and a global leader in hydrogen production, distribution and hydrogen fueling stations
- 180 hydrogen fueling projects resulting in approximately 1,000,000 fuelings per year.

To provide an idea of the size of Air Products which equates to the resources available to support the production, packaging, logistics and delivery system related to hydrogen, the following table is provided:



Air Products has an unsurpassed safety record in the production, storage, handling, and distribution of hydrogen and other gases. We have earned more safety-related awards than any other industrial gas company, and have taken a leadership role in supporting the market in the safe use of hydrogen fuel.

Air Products has a dedicated Hydrogen Fuel Station Engineering team of over 20 engineers. These engineers collectively have over 100 years of experience designing, building and installing hydrogen fuel stations, in addition to their extensive experience supplying hydrogen equipment for industrial customers. Air Products also has a dedicated Hydrogen Fuel Station Operations team of over a dozen engineers and technicians located to directly support these fuel stations in the California market.

Since the early 1990s, Air Products' safety, operations, and engineering teams have participated in various safety hazard reviews involving advanced hydrogen energy systems, including hydrogen fuel cell powered vehicles, refueling stations, and numerous demonstration projects. Beginning with our initial station, our safety approach is unique in the industry and, in fact, Air Products has become the standard of the industry over time. In addition, the company's experts are active participants on both national and international committees for developing codes and standards for hydrogen technologies.

As evidence of our progressive and active participation in the industry, Air Products participates in and has worked with the following safety, codes and standards activities:

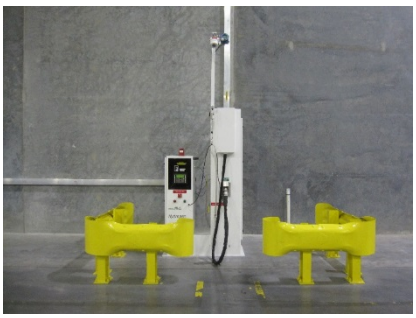
- NFPA 2 Technical Committee
- NFPA 55 Technical Committee
- Hydrogen Safety Panel
- SAE J2600, SAE J2601
- Canadian Standards Association (CSA) HGV series standards
- Factory Mutual
- Compressed Gas Association committees including the Hydrogen Technology Committee

Air Products' direct membership on several of these organizations is testimony to Air Products' commitment to being a subject matter expert regarding all aspects of hydrogen, as well as our

commitment to the safe growth of the hydrogen industry. Furthermore, Air Products is in a continual collaboration and learning mode due to interactions with Authority Having Jurisdiction (AHJ), third party inspection agencies, professional engineers and the customer's HAZOP review process. Air Products extensive knowledge of the industry is built into the system we are proposing. The proposed hydrogen fueling equipment meets Code requirements, and exceeds them in many aspects.

2.B Hydrogen and Fuel Cell Experience

Air Products has hands-on operating experience at over 180 hydrogen fueling station projects worldwide. A summary of a few of those installations is highlighted below.



Lowes, Adairsville, GA

In the summer of 2012, APCI installed a liquid hydrogen tank, compression skid, gaseous storage tubes and six dispensers at the Adairsville facility. Aside from the initial operational period for the system when there were vent system issues, the system has quietly become a ubiquitous hydrogen supply source. The dual compressor system has reliably provide pressurized product since its installation. Our performance at the site is best left judged by our customers at the site, the Lowe's Adairsville team.

Central Grocers, Joliet, IL

Air Products installed indoor hydrogen fueling infrastructure to fill a fleet of over 200 fuel cell powered lift trucks at Central Grocers' distribution center in Joliet, Illinois. Central Grocers' distribution center became operational at the end of the first quarter of 2009. At the time, the facility represented the single largest deployment of fuel cell vehicles in the world, as well as the first greenfield facility to adopt hydrogen fuel cell powered forklifts.

Air Products' indoor hydrogen fueling dispensers and related infrastructure fuels the fleet of new lift trucks supplied by Yale Equipment Services, located in Rosemont, Illinois and fitted with Plug Power's GenDrive™ hydrogen fuel cell power packs. Air Products' fueling infrastructure includes an outdoor liquid hydrogen storage and compression system, along with multiple indoor fueling dispensers for operator refueling. The GenDrive power units can be quickly refueled by the lift truck operator in less than two minutes.

The Kroger Company – Forest Park, GA

Air Products latest system was installed for the Kroger Company in Forest Park, GA. The system comprises of the tank, cryogenic compression skid, 12 gaseous storage tubes and 5 dispensers which support approximately 250 forklifts. Air Products exceeded project expectations and the system has been operating flawlessly since installation. Just as with the Lowe's Adairsville site, our performance at the site is best left judged by our customers at the site, the Kroger Forest Park team.

Of the 180 hydrogen fueling station projects provided by Air Products, over half have supported the automotive market. The technological principles are very similar and the experience gained is transferrable between the material handling market and automotive market.

Air Products first major fueling station project consisted of supplying the Chicago Transit Authority station in 1997. Efforts continued to grow with the installation of the Ford Dearborn fueling station in 1998 and Air Products provided the overall project management and design for the California Fuel Cell Partnership station in 2000. Since then, Air Products fueling experience has continued to grow rapidly. For example, Air Products has deployed over 40 stations that dispense 700 bar hydrogen into passenger vehicles. Some automotive projects include:

California Energy Commission Infrastructure Development

Air Products was awarded 10 stations in California funded under two solicitations from the California Energy Commission (CEC). An additional 19 sets of station equipment are being provided by Air Products to FirstElement Fuel, Inc. under their CEC grant agreements. Air Products hydrogen refueling stations account for ~60% of the market in California. The first operational station was commissioned in February 2015 with all stations operational by the end of calendar year 2016. A picture of the retail dispenser is provided. These projects and our market share demonstrate our hydrogen expertise with regards to production, delivery and equipment.

South Coast Air Quality Management District (SCAQMD)

Air Products designed and constructed five hydrogen fueling stations for the California South Coast Air Quality Management District (SCAQMD). Fueling stations are located in Burbank, Riverside, Santa Monica, Ontario and Santa Ana, and were commissioned during 2005 and 2006. In Burbank, Santa Monica and Riverside, Air Products' Series 200 system, a totally integrated vehicle fueling system, provides the storage, compression and dispensing of hydrogen to the vehicles. Hydrogen was generated onsite using electrolyzers supplied by Proton Energy Systems. The stations filled primarily fleets of Toyota Prius that were converted to run on hydrogen (HICE). Additionally, numerous OEM fuel cell vehicles filled at these sites.

Burbank

Riverside

Santa Monica

3. Project Safety

3.A Identification of Safety Vulnerabilities (ISV)

Air Products utilizes a combination of methodologies to identify potential safety vulnerabilities within a hydrogen refueling system. The primary method is through a site specific hazard review, or HAZOP.

A HAZOP is performed on the standard product line, and each individual system has an independent safety review performed to ensure proper compliance of each site to meet the HAZOP and code compliance. Every system is evaluated based upon this method and hazards are identified. As followup to the HAZOP, a variety of checklists are utilized. These include siting checklists to verify NFPA 2 siting requirements, HAZOP safeguard action items, and operational readiness inspections (ORI), among many others. These are used to ensure vulnerabilities have been identified and corrective action items are completed prior to startup.

Where identified by the HAZOP, Air Products also employs additional tools such as fault tree quantification, layer of protection analysis (LOPA), dispersion analysis, and radiation analysis as part of the design process.

Air Products has a strong and multi-disciplined team to participate in the HAZOP process. The HAZOP process is led by the Air Products Process Safety team, but includes representatives from the Project, Product, Process Controls, Machinery, Mechanical Equipment, and Operations teams as well.

The Process Safety Lead coordinates with the Project Engineer to ensure all hazards are identified, recommendations completed, and appropriate safeguards are in place.

The HAZOP action item checklist is owned by the Project Engineer who ensures their completion for every system. Finally, the Operational and Readiness Inspection is completed prior to startup and owned by the Air Products Operations Team to verify all checklist items are completed before startup.

Every product has inherent hazards associated with it, such as flammability for hydrogen. These hazards are well known and are easily and consistently managed by system design and proper training. There are a number of sources of information about these hazards, the most common being the Material Safety Data Sheet (MSDS) and the Air Products' SAFETYGRAM, which are attached for reference. Only personnel who are properly trained and are wearing the proper personnel protection equipment should directly handle or interface with these products. These documents are also provided as part of every Opearting Manual and are kept on-site at fueling stations.

The primary hazard associated with a hydrogen fuel station is the potential release of pressure and flammable fuel in the immediate vicinity of the fueling public. Extensive analysis has been incorporated into the design of Air Products' systems to mitigate this hazard and reduce risk to an acceptable level. Air Products has been supplying hydrogen fueling stations since well before the establishment of the applicable codes and standards (within NFPA 52, International Fire Code, NFPA 2, etc.). Much of this experience and many of these safeguards have subsequently been incorporated into these codes and their evolutionary process. As an example, listed below are some of the safeguards provided to protect the consumer from a potential release of hydrogen during the fueling process:

- Compliance with applicable Codes and Standards such as NFPA 2, NFPA 55, International Fire Code, California Fire Code, SAE standards, CGA standards, and CSA standards
- Third party certification of the equipment to demonstrate compliance
- Full permitting from AHJ to demonstrate compliance
- System designed with piping rated well beyond operating limits
- Flame and gas detectors

- Breakaway connectors with all fittings shielded from the fueling operator
- Multiple levels of fuel shutoff for emergency activation
- User interface that provides training and guidance on fueling process
- Electronic leak checks between, prior to, during, and after the filling process
- Electronic hardware self-checks on each fill
- Secondary control system to verify proper operation of primary controller

Similar methodologies and safeguards are present in other portions of the system. Air Products follows a "code-plus" philosophy and includes safeguards that exceed code requirements.

Overall, the identification of safety vulnerabilities is dictated by Air Products' internal Environmental, Health and Safety (EH&S) manual, Volume 1, Section 9 procedures. The table is attached to provide documentation of those procedures which impact the identification of safety vulnerabilities.

SECTION 9 - PROCESS SAFETY MANAGEMENT

Document	Priority	Rev	Title	Region	FAQs?	Job Aids?	Effective Date
25-0015	3	0	Trade Secrets OSHA PSM	North America			May 16
25-0016	3	0	OSHA PSM Training Requirements	North America			May 16
25-0017	3	0	Maintaining Process Safety Management (PSM) Documentation	North America			May 16
25-010901a	1	1	Project Hazard Review Process			yes	Feb 13
25-010901b	1	1	Operating Plant Hazard Review Process			yes	May 13
25-010904	1	1	Operational Readiness Inspection Process (or Pre-Start-up Safety Review)			yes	Feb 15
25-010904A	1	0	Operational Readiness Inspection Process (or Pre-Startup Safety Reviews) - supporting OPS eMOC only	Global			May 16
25-010905	1	0	Management of Change			yes	Dec 14
25-010905A	1	0	Management of Change - supporting OPS eMOC only	Global			May 16
25-010906	1	1	Quantitative Risk Analysis of Onsite Hazards for Owned and Operated Facilities	Global			Feb 16
25-010907	3	1	Offsite Quantitative Risk Analysis of Hazards				Aug 14

25-010911	2	0	Managing Changes of Personnel Involved in Plant Process Safety Activities			yes	Sep 14
25-010912	1	1	Siting and Design of Occupied Plant Buildings for Overpressure Protection	Global			Oct 15
25-010913	1	1	Siting of Occupied Buildings for External Fire Protection	Global			Feb 16
25-010935AM	3	0	OSHA PSM Process Safety Information	North America			Apr 12
25-010938	1	0	Seveso Directives (Europe Only)	Europe			Oct 13
25-010951AM	3	0	Definition of a Covered Process	North America			Jan 09
25-010970AM	2	0	Inventory Control of Bulk LHY Tanks	North America			Oct 12
25-010974	3	0	Methodology for the Identification of Major Accident Hazards (Europe Only)	Europe			Oct 13
25-010975	3	0	Requirements for CE Marking to European Directives	Europe			Jan 09
25-010976	3	0	Management Structure and Terms of Reference of the CE Plating and PED Steering Committees				Jan 09
25-010977AN	3	0	Guidance for Evaluating the Hazardous Zone in the General Vicinity of Oxygen and Inert Vents	Europe			Jun 13
25-010978	3	0	Application and Implementation of the Pressure Equipment Directive				Jan 09
25-010979	3	1	Process Safety Issue Identification and Management				Sep 14
25-010980AN		0	Technical Responsibility for the European Merchant Business	Europe			Aug 12
25-010981AM	3	1	EPA's Risk Management Program	North America			Nov 12

3.B Risk Reduction Plan

As noted above, Air Products primarily follows the HAZOP methodology for identifying potential safety hazards. Once a hazard is identified, one or multiple safeguards are required in order to sufficiently mitigate the risk. At the completion of the HAZOP, the complete list of safeguards are provided to the Project Engineer for implementation. Completion of these safeguards are mandatory before startup, and are incorporated into the ORI checklist.

In addition to internal checks and procedures, the Air Products fueling systems are evaluated and inspected by a third party certification body to ensure compliance with the relevant and applicable codes.

The stations also comply with the permitting process of the local municipality and associated Authorities Having Jurisdiction. The station will commence operation only after all inspections are complete and permits issued.

3.C Operating Procedures

Each system is provided with an Operations and Maintenance manual which includes specific procedures for the safe operation and maintenance of the hydrogen fueling stations.

At a higher level, Operating Procedure requirements are dictated by the internal Air Products' EH&S manual. The table attached below provides documentation of some of these procedures which impact the operation of a hydrogen fuel station as well as operating procedures.

Operating procedures are developed with Operations and Maintenance technician input and are verified through "real world" application. Training is provided for these procedures.

Hydrogen fuel stations contain less than 10,000 pounds of hydrogen, and therefore are not under the jurisdiction and authority of OSHA's Process Safety Management. However, the principles of PSM are not limited to large systems. Air Products applies these same process safety management procedures to our other systems as well.

OPERATING MANUAL TABLE OF CONTENTS			
Chapter		**Chapter**	
1.	**Introduction**	**3.**	**Installation**
1.1.	Scope	**4.**	**Operation Readiness Inspection**
1.2.	Copyright	**5.**	**Equipment Modules**
1.3.	Equipment Specification	5.1.	Dispenser
1.4.	Vehicle Requirements	5.2.	Cooling Block
1.5.	Contact Information	5.3.	Compression Skid
1.6.	Revision Control	5.4.	Ground Storage
2.	**Safety**	5.5.	Utility Enclosure
2.1.	System Safety	**6.**	**Maintenance**
2.2.	Emergency Procedures	6.1.	Preventative Maintenance Plan
2.3.	Do's	6.2.	Trouble Shooting
2.4.	Don'ts	6.2.1.	Dispenser Interface
2.5.	Emergency Procedures	6.2.2.	Compression Skid Interface
2.6.	MSDS's and Safety Grams	6.3.	Spare Parts
2.6.1.	Hydrogen MSDS	**7.**	**Appendix**
2.6.2.	Propylene Glycol MSDS	7.1.	Installation Documents
2.6.3.	Refrigerant MSDS	7.2.	Equipment Documents
2.6.4.	Compressor Oil MSDS		
2.6.5.	Gaseous Hydrogen Safetygram		

SECTION 9 - PROCESS SAFETY MANAGEMENT

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25-0015	3	0	Trade Secrets OSHA PSM	North America			May 16
25-0016	3	0	OSHA PSM Training Requirements	North America			May 16

25-0017	3	0	Maintaining Process Safety Management (PSM) Documentation	North America			May 16
25-010901a	1	1	Project Hazard Review Process			yes	Feb 13
25-010901b	1	1	Operating Plant Hazard Review Process			yes	May 13
25-010904	1	1	Operational Readiness Inspection Process (or Pre-Start-up Safety Review)			yes	Feb 15
25-010904A	1	0	Operational Readiness Inspection Process (or Pre-Startup Safety Reviews) - supporting OPS eMOC only	Global			May 16
25-010905	1	0	Management of Change			yes	Dec 14
25-010905A	1	0	Management of Change - supporting OPS eMOC only	Global			May 16
25-010906	1	1	Quantitative Risk Analysis of Onsite Hazards for Owned and Operated Facilities	Global			Feb 16
25-010907	3	1	Offsite Quantitative Risk Analysis of Hazards				Aug 14
25-010911	2	0	Managing Changes of Personnel Involved in Plant Process Safety Activities			yes	Sep 14
25-010912	1	1	Siting and Design of Occupied Plant Buildings for Overpressure Protection	Global			Oct 15
25-010913	1	1	Siting of Occupied Buildings for External Fire Protection	Global			Feb 16
25-010935AM	3	0	OSHA PSM Process Safety Information	North America			Apr 12
25-010938	1	0	Seveso Directives (Europe Only)	Europe			Oct 13
25-010951AM	3	0	Definition of a Covered Process	North America			Jan 09
25-010970AM	2	0	Inventory Control of Bulk LHY Tanks	North America			Oct 12
25-010974	3	0	Methodology for the Identification of Major Accident Hazards (Europe Only)	Europe			Oct 13
25-010975	3	0	Requirements for CE Marking to European Directives	Europe			Jan 09
25-010976	3	0	Management Structure and Terms of Reference of the CE Plating and PED Steering Committees				Jan 09
25-010977AN	3	0	Guidance for Evaluating the Hazardous Zone in the General Vicinity of Oxygen and Inert Vents	Europe			Jun 13
25-010978	3	0	Application and Implementation of the Pressure Equipment Directive				Jan 09

25-010979	3	1	Process Safety Issue Identification and Management				Sep 14
25-010980AN		0	Technical Responsibility for the European Merchant Business	Europe			Aug 12
25-010981AM	3	1	EPA's Risk Management Program	North America			Nov 12

3.D Equipment and Mechanical Integrity

Systems can be owned by either Air Products or by other external parties. Regardless of ownership, the following ongoing and preventative maintenance procedures are provided for the station.

During initial startup, systems are fully function tested to ensure complete safety and operational performance. Mechanical systems are fully leak tested via a pneumatic pressure test to 1.1x MAWP for each respective line. Electrical systems are checked for continuity, proper voltage, and calibrated for instrument settings and range. Finally, the dispenser is tested for SAE J2601 compliance and Weights and Measures certification.

As shown in fault tree quantification studies, system design alone is not adequate without appropriate maintenance procedures and requalification of equipment. A system that meets safety requirements when built will not meet those requirements later if the equipment and safeguards are not proven to be functional. For this reason, Air Products provides a preventive maintenance checklist for monthly, quarterly and annual proof checks and inspections for equipment. For example, all gas detection equipment is calibrated per manufacturer requirements and all critical safety circuits are function tested at least annually. These preventive maintenance checklists are completed by highly trained maintenance technicians whose primary focus is to support hydrogen fueling stations.

Air Products' delivery drivers, who do not make mechanical repairs, are trained and instructed to report all repair requests to the responsible maintenance department after each delivery of product. This provides additional frequency of inspection for each system since product can be delivered on a daily basis. Our goal is to maintain a totally reliable, safe, and functional system.

In addition to inspecting for leaks, mechanical integrity and general condition of the system, the following guidelines are followed. In all cases, Federal, State, or Local regulations take precedence if they are more stringent. Whenever individual customer requirements supersede these, the more stringent requirement is utilized.

An example of a Mechanical Integrity program is the maintenance of the hydrogen high pressure storage vessels. Programs are in place to ensure the requirements of the pressure vessels, be they ASME or DOT, are maintained. The fueling station counts the pressure cycles for the ASME vessels to track their inspection intervals and overall fatigue life. DOT vessels are maintained in compliance with DOT retest procedures and are tested every five years.

Overall, preventative maintenance and inspections requirements are dictated by Air Products' internal EH&S manual, Volume 1, Section 20 procedures. The following table is attached to provide examples of some of these existing procedures which impact preventative maintenance and inspections.

Air Products has extensive experience designing and building hydrogen systems over 100 MPa. Of particular importance for these systems is proper material compatibility. Air Products has in-house metallurgy expertise on which we rely for proper material selection. That expertise is supported by

additional information provided by Technical Reference sites such as those provided by Sandia. Using hydrogen storage as an example, Air Products has spent the last 20 years evaluating pressure vessel construction and design as the pressure requirements rose from 20 MPa to 100 MPa. We have worked closely with Code development bodies such as ASME and NFPA as codes were developed in parallel with station development. We also work closely with our vendors as they have developed equipment specifically for the needs of our fuel stations. As a result, the pressure vessels proposed for this project are fully compliant with the applicable ASME standards for material compatibility, cycle life and pressure rating. Similar practices have been used for other components of the system.

SECTION 20 - INSPECTION AND MAINTENANCE

Document	Priority	Rev	Title	Region	FAQs?	Job Aids?	Effective Date
25-012001	3	0	Planned Inspection and Maintenance	Global			May 14
25-012002	3	0	Risk Based Inspection (RBI) Methodology For Vessels and Piping	Global			May 14
25-012003	3	0	Fire Detection and Protection Systems				Jun 09
25-012004	3	0	Emergency Eyewash/Shower Equipment			yes	Sep 14
25-012005	3	2	Fire Extinguisher and Maintenance			yes	Oct 14
25-012006	1	4	Global Relief Device Testing and Inspection	Global			Feb 16
25-012008	3	1	Tool Inspection	Global		yes	Nov 15
25-012010	2	1	Selection of Cleaning Agents and Methods for Equipment Used in Oxygen Service				Jul 12
25-012011	2	0	Leak Detection		yes	yes	Jun 10
25-012012	2	0	Leak Repair				Jun 10
25-012013	2	0	Mechanical Integrity of Process Equipment				Oct 14
25-012014	2	0	Mechanical Integrity of Uninterruptible Power Supply (UPS)				Jun 12
25-012015	1	0	Block Valve Use With Relief Devices				Nov 11
25-012016	1	1	Policy For Administration of Captive Key and Lock Open Valve Systems		yes	yes	Dec 11
25-012024	2	0	Mechanical Integrity of Safety Instrumented Systems (SIS)			yes	Jul 13
25-012028	3	1	Storage Tank Electrical Earthing Inspection and Testing	Global			Oct 14

25-012036	1	2	Authorization for Approval of Extensions to Mechanical Integrity Inspection, Test Intervals, and Repairs	Global			Oct 15
25-012037	2	1	Mechanical Integrity Program for Pressure Systems In Production Plants	Global		yes	Nov 14
25-012039	1	0	Mechanical Integrity Work Process	Global	yes		Feb 15
25-012040	2	0	Prevention and Control of Legionella in Water Systems [Reaffirmed Nov. 2014]				Nov 14
25-012041AM	3	0	Quality Assurance for Mechanical Integrity	North America			Sep 07
25-012042	2	1	In-Place Relief Device Testing Procedure				Oct 14

3.E Management of Change (MOC) Procedures

Implementation of a robust management of change process is important to the safe operation of any system, particularly for hydrogen fueling stations. Air Products has an established management of change process in place. This process is used so that any change to a system can be documented, reviewed, and approved through the appropriate channels. Ensuring that changes do not compromise equipment safety, personnel safety, and product integrity are of utmost importance.

Any change to a system requires that the MOC process be followed. The only two exceptions to this rule are changes that include replacement in kind components or operational changes that are within the system's operational capability. All other changes are documented on an MOC form that includes the proposed change, the justification for the change, the nature and duration of change, and all modified documents/procedures that are impacted by the change. This completed form is then reviewed by the relevant subject matter experts and operational groups that will be impacted by the change. Only after agreement is the MOC approved.

Approved MOCs are then returned to the project engineer for implementation. An MOC checklist is generated to ensure all action items are completed. The physical change, changes to procedures, training of operators, and updated documentation are examples of MOC checklist items. Also included are ergonomic and housekeeping items, temporary work instructions, and purging/recommissioning items necessary to bring the system online.

Every MOC must be approved by a team of approvers that are skilled and experienced with hydrogen fueling stations. The review team consists of representatives from Engineering, Operations, Process Safety, and Management. The review team also identifies additional reviewers as needed to provide technical input. All MOC's are stored electronically in either the on-line MOC database or the on-line project file for the system.

The MOC procedure is found in Volume 1, Section 9 of our internal EH&S manual.

3.F Project Safety Documentation

Project safety is also proscribed by Air Products' internal EH&S manual, Volume 1, section 9 procedures.

All projects design, drawings, and safety information is saved and stored within our internal project management electronic databases.

The following table is attached to provide documentation of some of these procedures which impact project safety. Many of these procedures apply directly to the design and operation of a hydrogen fueling station. Many others provide the safe working environment for construction, installation, and operating activities that apply to all systems, but are equally important for hydrogen fueling stations.

SECTION 5 - SAFE SYSTEMS OF WORK

Document	Priority	Rev	Title	Region	FAQs?	Job Aids?	Effective Date
25-010501	1	1	Job Safety Analysis (JSA)/Workplace Risk Assessment		yes	yes	Jun 14
25-010501AN	1	0	Job Safety Analysis/Workplace Risk Assessment (Europe Attachment)	Europe			Mar 12
25-010506	2	1	Personal Protective Equipment Overview		yes	yes	Mar 13
25-010507	3	0	Head Protection		yes		Mar 13
25-010508	3	1	Eye Protection			yes	Jan 13
25-010509	3	0	Hearing Protection – Personal Protective Equipment				Feb 13
25-010510	3	1	Foot Protection			yes	Mar 13
25-010511	3	2	Hand Protection		yes		Nov 13
25-010512	3	3	Protective Clothing	Global	yes	yes	Jan 16
25-010514	3	0	Hydro-Jetting (Water Blasting) Safety			yes	Apr 13

25-010517	3	0	Safety Signs			yes	Mar 12
25-010517AN	3	0	Safety Signs (Europe Attachment)	Europe			Mar 12
25-010519	2	3	Welding, Cutting and Brazing Safety		yes	yes	Dec 14
25-010520	2	4	Electrical Safe Work Practices	Global	yes	yes	Apr 15
25-010521	1	0	Fall Protection				Jul 12
25-010522	2	1	Manbaskets - Replaced by 4WCE-600501			yes	Jul 01
25-010524	2	0	Bypass Policy	Global		yes	Oct 10
25-010529	2	2	Control of Excavation Work		yes	yes	Jan 15
25-010530	1	2	Safety Work Permit		yes	yes	Jan 12
25-010532	1	3	Energy Isolation and Lockout/Tagout/Try	Global	yes	yes	Mar 16
25-010533	1	1	Permit-Required Confined Space Entry		yes	yes	Nov 12
25-010534	1	1	Confined Space Rescue	Global		yes	Mar 16
25-010535	1	2	Portable Atmospheric Monitors for Confined Space Operations				Jul 12
25-010536	3	1	Confined Space Entry in Vessels Containing Adsorbents or Catalysts	Global			May 16
25-010537	1	2	Reclassification of Permit-Required Confined Spaces	Global	yes	yes	Apr 16
25-010538	2	2	Flash Fire Protective Clothing (FFPC)	Global	yes		Jan 16
25-010539	2	0	Use of Utility Gases and Fluids				Apr 14
25-010540	2	2	Scaffolding			yes	Oct 09
25-010541	2	2	Flammable Systems Purging	Global		yes	Feb 16
25-010542	1	1	Confined Space Entry Into IDLH Atmospheres	Global			Mar 16
25-010543	3	1	Ladder Safety	Global	yes	yes	June 16

25-010546	2	2	Electrical Safe Work Practices - For Q-EL / Fully Authorized Personnel	Global		yes	Apr 15
25-010549	3	1	Temporary Barricades				Mar 14
25-010550	2	2	Equipment/Line Opening and Clearing	Global		yes	Feb 16
25-010552	2	0	Crane Safety - See Engineering Standard 4WCE-600500			yes	
25-010553	2	0	Safe Use of Overhead Cranes - See Engineering Standard 4WCE-600503				
25-010560	3	0	Personal Atmosphere Monitor Risk Assessment				Mar 12
25-010561	3	1	Mobile Elevating Work Platforms		yes		Apr 14
25-010562	2	2	Driving Safety for Passenger Vehicles	Global	yes		Nov 15
25-010563	2	0	Hazardous Enclosures				Apr 12
25-010570	3	0	California Petroleum Safety Orders (U.S.)	North America			Apr 14

4. Communication Plan

It is important for the project team to communicate both internally and externally for a successful and safe project. A key step at the initial project development stage is to engage appropriate local stakeholders for the project, including the authorities having jurisdiction and neighbors of the facility. As appropriate, outreach efforts will be established to communicate the nature of the project as well as the overall scope. For example, this can consist of attending town hall meetings, planning commission meetings, school board meetings, etc. Education is an important step to ensure future support for the project.

After initial approval and permits are obtained, communication will continue with training provided to local first responders, facility personnel, and operators of the fueling station.

4.A Training

Training has two components; an EH&S component and a technical component. The EH&S component is dictated by Air Products' internal EH&S manual, Volume 2, which has 20 sections. The attached title depicts one of the internal standards which define the required training for all employees. Training is tracked via an on-line corporate training database. This database also notifies employees when refresher training on a particular topic is required.

The technical component of training is handled by the engineering and operations teams. For example, the operations team has a procedure that lists competencies for each grade level of technician.

There are 4 levels of Air Products' Maintenance technicians (Level 4 is New Hire, Level 1 is the highest rating).

- Level 4 to level 3 requires mastery of over 600 skills.
- Level 3 to level 2 adds an additional 478 skills.
- Level 2 to level 1 adds an additional 401 skills.
- The total skills to reach Level 1 = 1,479 skills.

Hydrogen fuel station technicians have specific competencies that are required for hydrogen fueling stations.

4.B Safety Reviews

As previously described, Air Products uses the HAZOP methodology as the primary safety review for any project. If deemed necessary or required by local jurisdictions, additional safety reviews or analysis are performed. Layer of protection analysis (LOPA), NEPA/CEQA environmental reviews, and root cause analysis (RCA) are all tools Air Products have used in the past to identify and address any safety related issues.

Systems are also third party certified to meet applicable codes and standards, plus reviewed and approved by the Authority Having Jurisdiction.

4.C Safety Events and Lessons Learned

Air Products utilizes the HAZOP procedure to identify project related risks during the intial execution. As systems are commissioned, and throughout ongoing operations, safety related incidents and near misses are recorded and investigated through the Event Management (EM) tool within our internal system. The procedures to be followed are highlighted in the below chart. At a high level, the details of an incident are recorded by an initiator. Next an investigation lead is selected. Then an investigation team is created who performs the investigation and creates action items to address any deficiencies that led to the incident. Depending on the case, changes to materials, equipment, or procedures are made to address the site specific incident as well as prevent similar cases from occurring in the future.

In addition, Air Products also has a Design Near Miss system for items that are found in the design of systems prior to installation. These are also recorded and investigated in similar fashion.

After projects are completed, the project team will meet to review what went well and what didn't, with a special emphasis on safety issues.

SECTION 11 - INCIDENT REPORTING AND INVESTIGATION

Document	Priority	Rev	Title	Region	FAQs?	Job Aids?	Effective Date
25-0002	2	0	EU Injury and Illness Management	Europe		Yes	Feb 16
25-011101	1	7	Incident Notification, Investigation and Reporting	Global	yes	yes	Oct 15
25-011102	3	0	Red Border Reports and EHS Alerts			yes	Dec 09
25-011114AM	2	0	Vehicle Accident and Hazardous Materials Incident Reporting	North America			Sep 07
25-011117	3	0	Extraordinary Accident Investigation and Reporting				Aug 14

4.D Emergency Response

There are, of course, any number of emergency scenarios that could develop during the operation of a fueling station. Systems are designed with large safety factors and numerous safeguards in anticipation of all likely problems. Based on this design, the worst case scenarios should create no extreme hazard. However, incidents can still occur and must be addressed via appropriate planning and procedures. Training on these procedures is provided to the local maintenance and operating staff, the site owner and employees, and the local first responders.

The following procedures provide some examples of internal procedures for to address appropriate emergency.

This information represents first-level responder information, as defined by the Federal HAZWOPER Regulations.

SECTION 8 - EMERGENCY PREPAREDNESS

Document	Priority	Rev	Title	Region	FAQs?	Job Aids?	Effective Date
25-010801	3	2	Emergency Management Overview				Jun 11
25-010802	1	1	Site Emergency Planning	Global		yes	Mar 16
25-010804	2	1	Lone Working	Global		yes	Nov 15
25-010816AM	2	0	Hazardous Materials Emergency Response Operations (U.S.)	North America			Sep 07
25-010819	2	0	Response to Off-site Emergencies Involving Air Products' Products or Wastes				Sep 09
25-010820	2	0	Off-Site Emergency Response Process Management				Sep 10

4.E Self Audits

Air Products will be responsible for a number of key safety procedures throughout this project. The HAZOP review, ORI, and MOC process are a few examples. Air Products' Project and Engineering team are responsible for the execution of all applicable procedures during the project. These procedures ensure that all equipment is designed to the latest Air Products and industry standards and are safe for delivery to our customers. In addition, Air Products will be responsible for the startup and commissioning of each station. Before any hydrogen can be introduced, all checklist items must be completed. This ensures the system is ready before any flammable gas enters the system.

Air Products will work closely with our project partners to maintain a safe working environment. We are subject to audit by our customers and likewise, we audit our vendors and contractors to ensure compliance with our standards.

Air Products also has procedures to ensure compliance with internal standards, and the project team is subject to audit at any time. For example, a random drug testing program is in place for all employees that are in safety sensitive roles. There is also a system for management personnel to perform inspections of construction and operating sites during field visits.

4.F ISO/OHSAS

Air Products has developed an extensive management system to address Environmental, Health & Safety. Our EH&S Management System supports the principles promoted by international standards such as ISO 14001 (Environmental) and OHSAS 18001 (Occupational Health and Safety). The components of those principles are depicted in the attached table.

OHSAS 18001 (Occupational Health & Safety)	ISO 14001 (Environmental)	APCI EH&S Management System*
General Requirements - Management System	**General Requirements - Management System**	√
OH&S Policy	**Environmental Policy**	√
Planning	**Planning**	√
Planning For Hazard Identification, Risk Assessment And Risk Control	Environmental Aspects	√
Legal And Other Requirements	Legal And Other Requirements	√
Objectives	Objectives And Targets	√
OH&S Management Programme(S)	Environmental Management Programme(S)	√
Implementation And Operation	**Implementation And Operation**	√
Structure And Responsibility	Structure And Responsibility	√
Training, Awareness And Competence	Training, Awareness And Competence	√
Consultation And Communication	Communication	√
Documentation	Environmental Management System Documentation	√
Document And Data Control	Document Control	√
Operational Control	Operational Control	√
Emergency Preparedness And Response	Emergency Preparedness And Response	√
Checking And Corrective Action	**Checking And Corrective Action**	√
Performance Measure And Monitoring	Monitoring And Measurement	√
Accidents, Incidents, Non-Conformances And Corrective And Preventive Action	Non-Conformance And Corrective And Preventive Action	√
Records And Records Management	Records	√
Audit	Environmental Management System Audit	√
Management Review	**Management Review**	√

5. Specific Requirements from Application Manual

5.A. Reporting of Unintended Hydrogen Releases or Incidents

Air Products shall report unintended hydrogen releases or incidents in accordance with the California Health and Safety Code Section 25510(a) and the *Safety Planning for Hydrogen and Fuel Cell Projects* guidance document (http://cersapps.calepa.ca.gov/Public/Directory). A copy of any report submitted to the Certified Unified Program Agency shall be submitted to the Energy Commission within 10 days in addition to any other required federal reporting (http://h2tools.org/lessons).

5.B. Annual Safety Evaluations

If funded under this solicitation, Air Products shall participate in annual safety evaluations at their cost with the DOE's Hydrogen Safety Panel (HSP) for three years after the station upgrade becomes operational. The evaluations will include the stations' adherence to the initial Safety Plan and any related Safety Plan implementation issues. Site visits may be conducted during the first year of the evaluation and annual safety evaluations via telephone will be conducted for the second and third year.

5.C. Safety and Alarm Systems

The hydrogen station control system is designed to detect any abnormal condition. All control valves fail in the safe direction (closed) after loss of utility power or instrument gas supply. Automatic restart of the compressor will not occur after abnormal, or "alarm condition" shut down to ensure safety of onsite personnel and equipment. All system alarms and shutdowns are displayed on the control panel face. Critical alarms are hard wired in addition to being connected through the programmable logic controller (PLC). This adds an extra layer of safety to the system. The compressor system will automatically shut down if a number of abnormal conditions occur, including high gas pressure, low suction pressure, high compressor discharge temperature, low oil pressure, and alarm indication from fire or gas detection systems. Users can also press an emergency stop button if an unsafe condition is observed.

Air Products is constantly monitoring the system 24 hours/day, 7 days/week. A modem provides remote access for troubleshooting, data logging, and monitoring hydrogen inventory and alarms. Station alarms will be routed to Air Products' Equipment Support Team, and our fueling technicians that are based in California are sent based on the type of alarm and the response to such alarm. Emergency stop buttons stop the system when pressed and are located both locally and remote from the station; the function is to completely isolate all power to equipment, shut all valves, and stop the dispensing process.

5.D Safety Training for Station Operators

Following commissioning and start-up of the upgraded station, Air Products will provide the training needed by UCI to operate the system; based on UCI's extensive experience with the current UCI station, one day of training is anticipated. Station users will continue to receive training on dispenser operation via the on-screen prompts provided with the retail dispenser.