HYDROGEN Safety Panel

SAFETY PLAN REVIEW

A3L/Next Hydrogen Hydrogen Fueling Station Safety Plan Review

Submission for the California Energy Commission General Funding Opportunity GFO-15-605

Background

At the request of the California Energy Commission (CEC), members from the Hydrogen Safety Panel (HSP) reviewed the A3 Labs (A3L)/Next Hydrogen Corporation Hydrogen Safety Plan. The Panel's feedback on the plan is summarized below. Annex A provides the Panel's evaluation on how adequately the safety plan addresses the required topics.

Summary of Results

The applicant's submission is merely a narrative describing the future content of a hydrogen safety plan (see *Safety Planning for Hydrogen and Fuel Cell Projects – March 2016*, available at https://h2tools.org/sites/default/files/Safety_Planning_for_Hydrogen_and_Fuel_Cell_Projects-March_2016.pdf for more information what is needed in the safety plan). Since the safety plan did not provide the required information, no HSP review could be performed and the document is considered incomplete, without much consideration for safety.

Comments

This Hydrogen Safety Plan did not include the necessary project-specific content in accordance with the guidance document, *Safety Planning for Hydrogen and Fuel Cell Projects – March 2016,* nor could it be fully evaluated as it contained only a brief description of what the applicant intends to provide in the future.

ANNEX A: CEC Safety Plan Review Checklist

This checklist is a summary of desired elements for safety plans taken from Safety Planning for Hydrogen and Fuel Cell Projects – March 2016.[1] The checklist is intended to help project teams verify that their safety plan addresses the important elements and can be a valuable tool over the life of the project. The items below should not be considered an exhaustive list of safety considerations for all projects.

GFO SUBMITTER OR TITLE: A3L/Next Hydrogen
DATE: December 20, 2016

Element	The Safety Plan Should Describe	Adequately Addressed? (Yes or No)
Scope of Work	• Nature of the work being performed	No
Organizational Policies and Procedures	• Application of safety-related policies and procedures to the work being performed	No
Hydrogen and Fuel Cell Experience	• How previous organizational experience with hydrogen, fuel cell and related work is applied to this project	No

Identification of Safety Vulnerabilities (ISV)	• What is the ISV methodology applied to this project, such as FMEA, What If, HAZOP, Checklist, Fault Tree, Event Tree, Probabilistic Risk Assessment, or other method
	• Who leads and stewards the use of the ISV methodology
	• Significant accident scenarios identified
	• Significant vulnerabilities identified
	• Safety critical equipment
	• Storage and Handling of Hazardous Materials and related topics
	  ○ ignition sources; explosion hazards
	  ○ materials interactions
	  ○ possible leakage and accumulation
	  ○ detection
	• Hydrogen Handling Systems
	  ○ supply, storage and distribution systems
	  ○ volumes, pressures, estimated use rates
		No

Risk Reduction Plan	• Prevention and mitigation measures for significant vulnerabilities	No
Operating Procedures	• Operational procedures applicable for the location and performance of the work including sample handling and transport • Operating steps that need to be written for the particular project: critical variables, their acceptable ranges and responses to deviations from them	No
Equipment and Mechanical Integrity	• Initial testing and commissioning • Preventative maintenance plan	No

[1] URL: https://h2tools.org/sites/default/files/Safety_Planning_for_Hydrogen_and_Fuel_Cell_Projects-March_2016.pdf

Element	The Safety Plan Should Describe	Adequately Addressed? (Yes or No)
	• Calibration of sensors • Test/inspection frequency basis • Documentation	
Management of Change Procedures	• The system and/or procedures used to review proposed changes to materials, technology, equipment, procedures, personnel and facility operation for their effect on safety vulnerabilities	No
Project Safety Documentation	• How needed safety information is communicated and made available to all participants, including partners. Safety information includes the ISV documentation, procedures, references such as handbooks and standards, and safety review reports.	No
Personnel Training	• Required general safety training - initial and refresher • Hydrogen-specific and hazardous material training - initial and refresher • How the organization stewards training participation and verifies understanding	No
Safety Reviews	• Applicable safety reviews beyond the ISV described above	No
Safety Events and Lessons Learned	• The reporting procedure within the team • The system and/or procedure used to investigate events • How corrective measures will be implemented • How lessons learned from incidents and near-misses are documented and disseminated	No
Emergency Response	• The plan/procedures for responses to emergencies • Communication and interaction with local emergency response officials	No
Self-Audits	• How the team will verify that safety related procedures and practices are being followed throughout the life of the project	No