

Case of Risk Analysis and Disaster Management Plan of CNG Infrastructure

1. About Installation

CNG Mother Station acts as main office for controlling all supply, maintenance and safety related issues for the entire CNG infrastructure. It receives gas from the feeder-line, which is compressed & then is dispatched through the cascades, to daughter station.

2. About Assignment:

The purpose of carrying out Risk Analysis is to study the nature & impact of hazards due to the handling & storage of CNG gas and also to analyze the nature of injury & extent of the consequences Off-site the Infrastructure so as to facilitate On-site & Off-site Emergency Preparedness Plan. The analysis aims at qualitative & quantitative evaluation of the consequence involved due to location and operation of the CNG and also to identify suitable measures to minimize the consequences. The findings result into recommendations for minimization of the existing levels of risk, and provide guidelines for increasing effectiveness of On-site & Off-site Emergency Preparedness Plan. This includes mitigation measures for various disaster scenarios such as fire, explosion natural calamities earthquake etc.by emergency preparedness plan, organization requirements and chain of commands, internal coordination, communication, medical services, transportation, emergency control center, external co-ordination, resources, arrangements, mutual aid etc.

3. How we Executed?

The study comprised of the following:

- Critical examination of hazard prone operations / units with an emphasis on quantification of hazard and its evaluation.
- Assessment of risk on the basis of the above evaluation against the risk acceptability criteria relevant to the situation.
- Estimation of frequency of occurrence of the most hazardous event in combination with the outcome of hazard identification and computation of individual and societal risks and risk contour plotting.
- Consequence Analysis and Vulnerability Analysis by using MOEF(ministry of environment &forest) approved PHAST models ,events and assess the effects of those events on the internal and external installations, people inside and outside in the vicinity as well as on the environment, preventive measures safety recommendations.
- Damages distances to be computed for credible release of hazardous material leading to fire and explosions through fire and explosion modeling:
 - Jet Fire
 - Dispersion
 - Flash Fire
 - Explosion (if possible)

4. Recommendations

Metering Skid:

1. In Metering Skid, two lines parallel are provided. In case if emergency occurs in one of the line, then valves of the respective line need to be closed as soon as possible. Also, valves of other line are required to be opened in order to keep flow continuity. Therefore, it is essential to ensure smooth operation of valves. It is recommended to weekly shift the line once to avoid jamming of valves.

2. Cleaning of strainer is to be carried out once in 6 month or earlier, if need felt, to ensure pressure drop across the suction strainer less than 1kg/cm².
3. Proper tar road must be constructed from Metering Skid to Mother Station
4. With reference to Flow Control Valve, Compressed air actuated Flow Control Valve has been provided at Metering Skid. However as there is no electricity supply at Metering Skid, compressor could not be provided and therefore Flow Control Valve is in operation.
5. Fire Extinguishers are to be provided at metering skid as per OISD as the available Fire Extinguishers are inadequate.

PIPELINE (Metering Skid to Mother Station)

6. With Reference to Cathodic Protection: Cathodic Protection is provided in the pipeline to protect the pipelines from Soil Corrosion. Testing of Cathodic protection is usually carried out after every 2 years; so same practice can be followed here also. As a test results mostly electrodes need to be replaced if electrode potential is found to be deteriorated.


Mother Station

7. Safety Issues related with Ethyl Mercaptan:
 - 7.1 Ethyl Mercaptan should be stored in cool, dry, well-ventilated areas which are away from heat, flame or oxidizers.
 - 7.2 Keep Ethyl Mercaptan container tightly closed & provide it with safety relief valve to release the pressure in case if it exceeds the safety pressure inside the container.
 - 7.3 While handling Ethyl Mercaptan, try to avoid contact with liquids or vapour. Therefore, use rubber gloves, protective over clothing and covered safety goggles/face shield.
8. Recommendation from safety point of view in the plant if fire occurs in handling & storing areas of Ethyl Mercaptan leading to release of toxic or flammable vapors:
 - 8.1 Keep the container cool by spraying water.

Daughter station

9. Pressure gauge should be provided on CO₂ flooding system
10. Earthing for static electricity discharge must be provided
11. Temperature gauge is not provided, it must be provided at the respective places
12. Disconnected lighting poles are to be removed
13. Canopy on CNG Cylinder must be provided

if interested please contact:

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