

Hazard and Operability Analysis (HAZOP) for 80K Cryo pump of LIGO India Vacuum Integrated System Test Assembly (LI_VISTA))

Abstract

LIVISTA facility at IPR consist of a large size 80K Cryopump. The main component of this Cryopump is a reservoir filled with liquid nitrogen (~ 800 L) at 80K and ~1.1 bar inside the vacuum chamber of approximately 15m³. Due to postulated incidents and accidents, pressure rise with in the available vacuum space may affect the operation of LIVISTA. In order to ensure the safety of personnel and system during accidental conditions, a study based on generation of HAZOP sheet is required. HAZOP is one of the methods for hazard identification used in process system. To avoid the injury to the operators and meet the requirements of local laws and regulations, some safety measures must be adopted. The HAZOP studies considered many system parameters such as pressure, temperature (80 K to 423K), flow rate (~ 1500 l/h), level (0 to 100%) etc. During the preliminary hazard analysis and study of the piping and instrumentation diagrams (P&IDs), causes and consequences of every abnormal deviation are required to address.

The project work involves the followings

- 1) Study of existing P&ID
- 2) Identification of deviation in process parameters
- 3) Identify and predict possible incidents (Cause and consequences)
- 4) Inclusion of safety to prevent potential accidents

This project also includes the literature survey, understanding of HAZOP study, ASME and report preparation

Academic Project Requirements:

1) Required No. of student(s) for academic project: 2

2) Name of course with branch/discipline: B.E./B.Tech. Mechanical Engineering

3) Academic Project duration:

(a) Total academic project duration: 12 Weeks

(b) Student's presence at IPR for academic project work: 3 Full working Days per week

Email to: ncgupta@ipr.res.in[Guide's e-mail address] and project_me@ipr.res.in [Academic Project Coordinator's e-mail address]

Phone Number: 079 -4025 [Guide's phone number]