



LABORATORI NAZIONALI DEL GRAN SASSO (L.N.G.S.)



LUNA - MV Project

Hazard Identification Analysis (Hazid)

Milan, 1 February 2016, rev. 01

Prepared by: Ing. A.Damiani

Verified by: Ing. D.Barone

INDEX

- 1 General
- 2 Team and Work Sessions
- 3 Hazid Performing and follow up
- 4 Conclusions

ANNEX

Hazid worksheets

1 GENERAL

The aim of any Hazid study is to identify major hazards at the earliest stage in order to maximize the flexibility available regarding the avoidance or mitigation of the associated risk. A Hazid may also be used to identify hazards for an existing facility.

In addition, the study facilitates:

- any early multi-disciplinary review of the project / plant,
- the sharing of ideas from other similar projects,
- the adoption of a consistent approach to safety studies at an early stage.

2 TEAM AND WORK SESSIONS

The Hazid for Luna MV Project has been performed in Milan, by the following team:

D. Barone (TL)	Team Leader
A. Damiani (TS)	Team Secretary
P. Prati	INFN (Principle Investigator)
A. Guglielmetti	INFN (Coordinator of Authorization Requests)
M. Junker	INFN (Accelerator)
S. Gazzana	INFN (Technical Coordinator)
L. Leonzi	INFN (Building & Infrastructure)

Hazid has been performed in a work session, on 15 July 2015.

The review of Hazid has been performed on 29 January 2016 in Milan, by the following team:

<i>D. Barone (TL)</i>	<i>Team Leader</i>
<i>A. Damiani (TS)</i>	<i>Team Secretary</i>
<i>P. Prati</i>	<i>INFN (Principle Investigator)</i>
<i>M. Junker</i>	<i>INFN (Accelerator)</i>
<i>S. Gazzana</i>	<i>INFN (Technical Coordinator)</i>
<i>G. Bucciarelli</i>	<i>INFN (Maintenance)</i>

With reference to the previous version of this document (20 July 2015, Draft) the parts changed after the revision of Hazid are reported in italics.

3 HAZID PERFORMING AND FOLLOW UP

Designers of Luna MV should make a brief presentation giving an overview of the installation highlighting important issues such as layout and modes of operation.

The Team Leader leads the Team in systematically examining the installation by means of the guidewords. The information generated are reported on Hazid worksheets (see Annex) where the potential consequences and existing safeguards are registered for each hazardous event analyzed. If it is necessary, recommendations and actions are proposed to mitigate risks connected to hazards.

To ensure a record of all made discussions, a full recording should be produced, also where no actions/recommendations are required or the guidewords are not applicable.

The recommendation and actions identified by Hazid have to be considered during the design in order to reduce the connected risks.

Review of Hazid *should* be performed at the completion of the design.

4 CONCLUSIONS

Based on Luna MV Technical Report (July 2015), the principal hazards identified by Hazid, requiring risk reduction, are:

- Release of liquid (water, PC) from Borexino and liquid in Hall C
- Low boiling temperature of SF6
- Decomposition of SF6 in HF and SO2 at high temperature
- Violent reaction of SF6 in case of contact with incompatible substances
- SF6 management
- Accumulation in bunker of SF6 (liquid/vapour)
- Combustible substances (possible fire) and SF6 decomposition
- *Accumulation of hydrogen in bunker (possible flash fire, explosion)*
- Exhaust nitrogen
- Vapours emergency release .

Number 15 recommendations/comments have been identified .