INFORMATION ON THE ACTIVITIES CARRYING RISK OF SERIOUS ACCIDENT (Legislative Decree no. 334/99 coordinated with Legislative Decree no. 238/05 – Seveso Ter Directive)

ALTRI ESPERIMENTI

Esperimento	Descrizione attività
LUNA 2	Effettua misure per studiare i processi termonucleari del Sole.
CUORE GENIUS GERDA CRESST	Esperimenti che osservano l'interazione di particelle rare.
DAMA	Effettua ricerche sulla "materia oscura" dell'universo.
OPERA	Misura le oscillazioni del neutrino sulla linea del fascio proveniente dal CERN di Ginevra.
ICARUS	Misura le oscillazioni del neutrino e il decadimento del protone.
WARP	Effettua ricerche sulla "materia oscura" attraverso lo studio di interazioni "deboli".
GIGS	Effettua studi di geofisica attraverso misure condotte da una stazione interferometrica.
Xenon	Effettua ricerche sulla "materia oscura" dell'universo mediante un rivelatore a bassa temperatura.
Pulex	Studia sistemi biologici mantenuti a bassa temperatura.

PIANO DI EMERGENZA INTERNO

In caso di allarme il personale ed i visitatori, dopo aver indossato i **dispositivi respiratori OXYBOX** (a generazione di ossigeno) ed eventuali indumenti protettivi su istruzione degli addetti all'emergenza, seguendo i percorsi indicati da apposita segnaletica, raggiungeranno il **luogo di raccolta principale n° 1** o quelli alternativi (n° 2 e n° 3) in base alle indicazioni ricevute dai mezzi di comunicazione e/o dal personale addetto all'emergenza.
I percorsi di emergenza e i luoghi di raccolta sono indicati nella figura seguente. Ivi pervenuti, provvederanno a comunicare la loro presenza al personale addetto all'emergenza e si atterranno alle indicazioni fornite.

OTHER EXPERIMENTS

Experiment	Description of the activities
LUNA 2	It takes measurements to study the thermonuclear processes of the sun
CUORE GENIUS GERDA CRESSI	Experiments to observe the interaction of rare particles
DAMA	It carries out research activities on the “dark matter” of the universe
OPERA	It measures the oscillations of the neutrino on the beam line coming from CERN of Geneva
ICARUS	It measures the oscillations of the neutrino and the decay of the proton
WARP	It carries out research activities on the “dark matter” through the study of weak interactions
GIGS	It carries out geophysics studies through measurements taken by an interferometric station
Xenon	It carries out research activities on the “dark matter” of the universe using a low temperature detector
Pulex	It studies biological systems kept at low temperature.

INTERNAL EMERGENCY PLAN

In case of alarm, after wearing OXYBOX respiratory devices (with generation of oxygen) and any other required personal protection equipment, both personnel and visitors will follow the instructions of the emergency team and use the routes marked by the appropriate signs to reach **assembly point no. 1** or any other alternative assembly points (no. 2 and no. 3), depending on the instructions received.
Emergency routes and assembly points are shown in the following figure.
Once they have reached the assembly points, their presence will be notified to the emergency team, and they will have to follow the instruction given.

	All dangerous situations must be notified by dialling number 200 using the telephones of the underground laboratories
	EMERGENCY ROUTES Laboratori Nazionali del Gran Sasso Prevention and protection service
	ASSEMBLY POINT NO. 2
	MAIN ASSEMBLY POINT NO. 1
	ASSEMBLY POINT NO. 1
	Hall A
	Hall B
	Hall B

PREVENTION AND PROTECTION SERVICE

INFN

LABORATORI NAZIONALI DEL GRAN SASSO
ISTITUTO NAZIONALE DI FISICA NUCLEARE
(National Institute for Nuclear Physics)

INFORMATION ON THE ACTIVITIES CARRYING RISK OF SERIOUS ACCIDENT

Prevention and Protection Service
Tel. 0862 437277 – 239 – 527; Fax. 0862 437556

e-mail: spp@lngs.infn.it

LABORATORI NAZIONALI DEL GRAN SASSO
ISTITUTO NAZIONALE DI FISICA NUCLEARE

INFORMAZIONI SULLE ATTIVITÀ A RISCHIO DI INCIDENTE RILEVANTE

I Laboratori Nazionali del Gran Sasso (di seguito LNGS) sono stati realizzati per effettuare ricerche di fisica ed astrofisica delle particelle elementari; a tali ricerche, si affiancano attività sperimentali nel campo della geofisica e della biologia.

Ciò è reso possibile dall'attività schermante fornita dagli oltre 1400 metri di roccia che riduce il flusso di raggi cosmici di circa un milione di volte, rendendo possibile la discriminazione di interazioni rare di particelle con materia predisposta come "rivelatore". In alcune attività sperimentali vengono utilizzate sostanze che possono rappresentare un rischio per la salute delle persone.

Le ricerche in corso ed in programmazione riguardano:

- ricerche sui neutrini
- neutrini solari
- oscillazioni e neutrini atmosferici
- neutrini da collassi stellari
- decadimento doppio beta
- ricerca della materia oscura
- decadimento del protone
- astrofisica nucleare
- osservatorio geofisico
- elementi di biologia

Gli ambienti sotterranei dei LNGS sono dotati di moderne tecnologie per garantire la sicurezza.

Gli operatori ed i ricercatori hanno a disposizione, in caso di necessità, i Dispositivi di Protezione Individuale (DPI) idonei ad affrontare le emergenze previste.

Per svolgere alcune attività di ricerca, è richiesto l'utilizzo di sostanze classificate pericolose secondo il D. Lgs. 334/99 e s.m.i.

Nella seguente tabella sono riportate sostanze e preparati soggetti al D. Lgs 334/99, in maniera conforme a quanto riportato nella scheda di informazione sui rischi di incidente rilevante per i cittadini ed i lavoratori (Allegato V del D. Lgs. 334/99).

LABORATORI NAZIONALI DEL GRAN SASSO
ISTITUTO NAZIONALE DI FISICA NUCLEARE

INFORMATION ON THE ACTIVITIES CARRYING RISK OF SERIOUS ACCIDENT

Laboratori Nazionali del Gran Sasso (hereinafter LNGS) were created to carry out physics and astrophysics research of elementary particles; such research is joined by experimental geophysics and biology activities.

All this is possible by the shielding provided by the over 1400 metres of rock, which reduces the cosmic radius flow by approximately one million times, allowing the discrimination of rare interactions of particles with matter prepared as "detector". In some experimental activities, substances are used that may represent a risk for the health of people.

The current research activities relate to the following

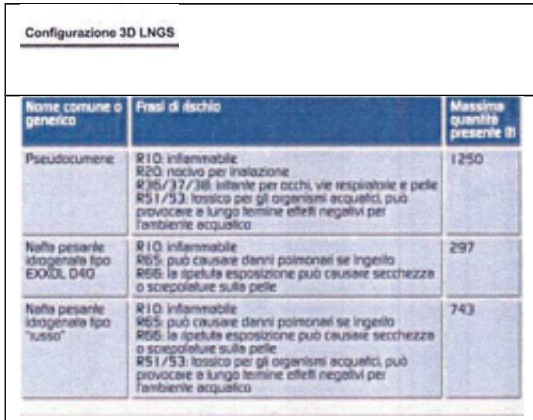
- research on neutrinos
- solar neutrinos
- oscillation and atmospheric neutrinos
- star collapse neutrinos
- double beta decay
- dark matter research
- proton decay
- nuclear astrophysics
- geophysical observatory
- biology elements

The underground areas of LNGS are equipped with modern technologies to guarantee safety.

In case of need, operators and researchers have available appropriate Personal Protection Equipment (PPE) to deal with the expected emergencies.

In order to carry out some research activities, the use of substances classed as dangerous pursuant to Legislative Decree no. 334/99 and subsequent amendments and integrations is required.

The following table shows the substances and the preparations subjected to the dispositions of Legislative Decree no. 334/99, in accordance with the content of the information card on the risks of serious accidents for citizens and workers (Attachment V of Legislative Decree no. 334/99).

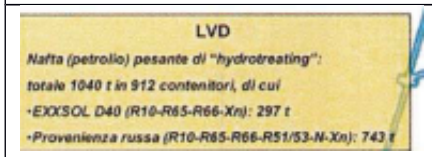


LNGS 3D Configuration

Common or Generic name	Risk captions	Maximum quantity present [t]
Pseudocumene	R10: inflammable R20: harmful if inhaled R36/37/38: irritant for eyes, respiratory tract, skin R51/53 toxic for aquatic organisms; it can cause long-term negative effects for the aquatic environment	1250
heavy hydrogenated naphthalene	R10: inflammable R65: it can cause lung damage if ingested R66: repeated exposure can cause skin dryness and chapping	297
"Russian" type heavy hydrogenated naphthalene	R10: inflammable R65: it can cause lung damage if ingested R66: repeated exposure can cause skin dryness and chapping R51/53 toxic for aquatic organisms; it can cause long-term negative effects for the aquatic environment	743

Substances found in the underground laboratories subjected to notification pursuant to Legislative Decree no. 334/99

Laboratori Nazionali del Gran Sasso

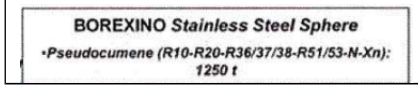


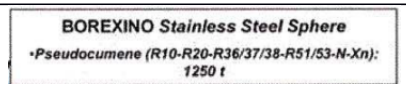
LVD

Heavy "hydrotreating" Naphthalene (petroleum)

total 1040 t in 912 containers, of which

- EXXSOL D40 (R10-R65-R66-Xn): 297 t
- Russian origin (R10-R65-R66-R51/53-N-Xn): 743 t





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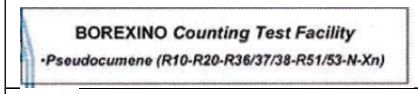
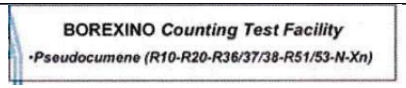
<tr><td> 
</td><td> 
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<tr><td> 
</td><td>Exit</td></tr>
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</td><td>Entrance</td></tr>
<tr><td> 
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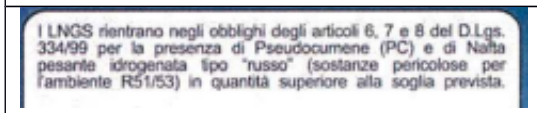
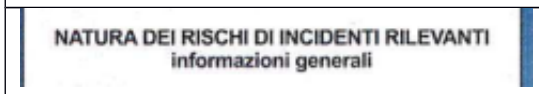
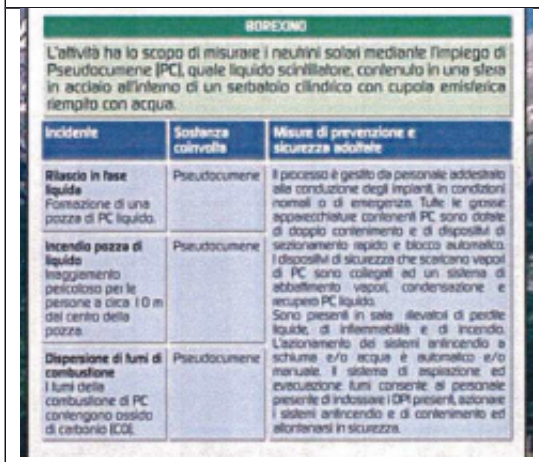
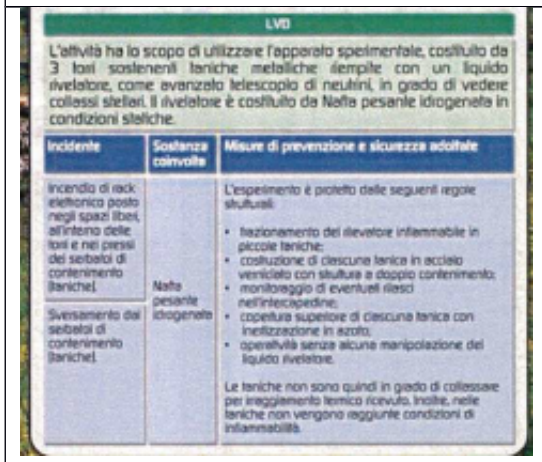
</td><td>Hall C</td></tr>
<tr><td> 
</td><td>LNGS fall within the requirements of art. 6, 7, and 8 of Legislative Decree no. 334/99 as far as the presence of Pseudocumene (PC) and of “Russian” type Heavy Hydrogenated Naphthalene (dangerous substance for the environment, R51/53) in quantities higher than the expected limit.</td></tr>
<tr><td> 
</td><td>NATURE OF THE RISKS OF SERIOUS ACCIDENTS
General Information</td></tr>
<tr><td> 
</td><td>BOREXINO
The scope of the activity is to measure the solar neutrinos using Pseudocumene as scintillator liquid, contained in a steel sphere inside a cylinder shaped tank with hemispheric dome and filled with water.
<table>
<tr><th>Incident</th><th>Involved substance</th><th>Prevention and safety measures implemented</th></tr>
<tr><td>Liquid stage release formation of a liquid PC puddle</td><td>Pseudocumene</td><td rowspan="3">The process is managed by personnel trained in running equipment in normal and emergency conditions. All the large equipment containing PC is fitted with double containment, and quick sectioning and automatic locking devices. The safety devices that discharge PC vapours are connected to a vapour abatement, condensation, and liquid PC recovery system. The room is equipped with inflammability and fire liquid leak detectors. The activation of foam and/or water fire fighting systems is automatic or manual. The smoke suction and evacuation system allows personnel present to wear the available PPE, to activate the fire and containment systems, and to evacuate the area in full safety.</td></tr>
<tr><td>Liquid puddle fire Dangerous irradiation for people at approximately 10 metres from the centre of the puddle</td><td>Pseudocumene</td></tr>
<tr><td>Spreading of combustion fumes The combustion fumes of PC contain carbon</td><td>Pseudocumene</td></tr>
</table></td></tr>
</table>

oxide (CO)			



LVD

L'attività ha lo scopo di utilizzare l'apparato sperimentale, costituito da 3 torri sostenenti taniche metalliche riempite con un liquido rivelatore, come avanzato telescopio di neutrini, in grado di vedere collassi stellari. Il rivelatore è costituito da Nafta pesante idrogenata in condizioni statiche.

Incidente	Sostanza coinvolta	Misure di prevenzione e sicurezza adottate
Incendio di rack elettronico posto negli spazi liberi, all'interno delle torri e nei pressi dei serbatoi di contenimento (taniche).	Nafta pesante idrogenata	L'esperimento è protetto dalle seguenti regole strutturali: • frazionamento del rivelatore infiammabile in piccole taniche; • costruzione di ciascuna tanica in acciaio verniciato con struttura a doppio contenimento; • monitoraggio di eventuali rilasci nell'intercapedine; • copertura superiore di ciascuna tanica con inertizzazione in azoto; • operatività senza alcuna manipolazione del liquido rivelatore. Le taniche non sono quindi in grado di collassare per irraggiamento termico ricevuto. Inoltre, nelle taniche non vengono raggiunte condizioni di infiammabilità.
Sversamento dai serbatoi di contenimento (taniche).		

LVD

The scope of the activity is to use the experimental equipment consisting of 3 towers supporting metal tanks filled with detector liquid, as advanced telescope of neutrinos capable of seeing star collapses, The detector consists of heavy hydrogenated Naphthalene in static conditions

Incident	Involved substance	Prevention and safety measures implemented
Fire in the electronic rack found in the free spaces inside the towers and near the containment basins (tanks).	Heavy Hydrogenated Naphthalene	The experiment is protected by the following structural rules • distribution of the inflammable detector into small tanks. • each tank is made of painted steel with double containment structure • monitoring of any releases in the interspace • upper cover of each tank with nitrogen neutralisation • operation without handling of the detector liquid The tanks are therefore not at risk of collapsing due to thermal irradiation received. In addition non inflammability conditions are reached inside the tanks.
Spillages from the containment basins (tanks).		