

	<p><b>Atacama Pathfinder EXperiment</b></p> <hr style="width: 10%; margin: auto;"/> <p><b>Safety Training</b></p>	<p>APEX- APX- PRO-0002</p> <p>Revision: 1.0</p> <p>Release: 2004-09-18</p> <p>Category: 1</p> <p>Institute L.-A. Nyman</p>
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# APEX Safety Training

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### Change Record

REVISION	DATE	AUTHOR	SECTIONS/PAGES AFFECTED	REMARKS
0.1	08.07.04	Nyman	New issue	
0.2	23.07.04	R. Kurz	All	
0.3	25.07.04	Nyman	All	Comments from LAN/JFL
0.4	01.08.04	Nyman	All	Comments from Boecker
0.5	11.08.04	Nyman	All	Comments from Güsten
0.6	18.09.04	Nyman	All	clarified definition of APEX base and APEX telescope site
1.0	27.09.04			Approval of R0.6 by Board

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## 1 Purpose

The purpose of this document is to provide a safety training plan for APEX staff and staff from APEX Partners.

## 2 Scope

This document applies to APEX Staff and APEX Partner Staff. The required safety training for the various classes of staff are given in the following table. Additional training is encouraged, but optional. Part of the training may also be used for contractors and visitors, as appropriate.

A subset of APEX staff and APEX partner staff who has taken all safety courses will be Site Certified Staff (SCS), who will be responsible for the safety of the people working at the APEX telescope site during their shift. There must always be at least one SCS in any group working at the APEX telescope site.

Training Course	APEX Staff	APEX Partner Staff
1. First Aid	Yes	Yes
2. Working at High Altitude	Yes	Yes
3. Safety Regulations	Yes	Yes
4. Emergency Procedures	Yes	Yes
5. Fire Fighting	Yes	some of staff
6. Driving and Use of Vehicle Safety Equipment	Yes	Yes
7. Operation of the Antenna	Yes	Yes
8. Operation of the Cherry Picker	Yes	some of staff
9. Use of Container Systems	Yes	Yes
10. Handling of Cryogenic Liquids and Gases	Yes	some of staff

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### 3 Documents

#### 3.1 Applicable documents

AD-01	APEX Safety Regulations	APEX-APX-PRO-0001
AD-02	Manual of ESO's Policies, Rules and Regulations concerning Safety, Health & Environmental Protection; Issue 2, 1 Sep 1997	SAF-POL-ESO-00000-0001
AD-03	APEX List of Safety material	APEX-APX-LIS-0001

#### 3.2 Reference documents

RD-01	Safety at ESO Web Page/Work at High Altitude <a href="http://www.eso.org/safety/">http://www.eso.org/safety/</a>
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### 4 Definitions

ACHS Asociacion Chilena de Seguridad

AGA TBD

CPR Cardiopulmonary Resuscitation

LSO La Silla Observatory

SCS Site Certified Staff

*APEX Partners* – the signatories of the APEX Memorandum of Understanding:

Max-Planck-Institut fur Radioastronomie (MPIfR),  
European Southern Observatory (ESO),  
Onsala Space Observatory (OSO), and  
Ruhr-Universitat Bochum (RUB).


*APEX Site* – the site of APEX construction and operations in Chile that consists of

*APEX Base* located in Sequitor near San Pedro de Atacama (altitude 2440 meters)

*APEX Telescope site* located in the ALMA Science Reserve on the Chajnantor plateau east of San Pedro de Atacama (altitude 5050 meters)

*APEX Staff* – the employees of the APEX Partners who are assigned to work on APEX at the APEX Site on a regular basis.

*APEX Partner Staff* – the employees of the APEX Partners who periodically work on APEX at the APEX Site, but not on a regular basis.

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## 5 Basic training

### 5.1 First Aid

Frequency of training: Every two years and on request if required.

- Basic first aid
- Cardiopulmonary Resuscitation (CPR)

### 5.2 Work at High Altitude

Frequency of training: Prior to start to work and on request if required.

- Introduction to acclimatization and high altitude sickness (RD-01)
- Basic altitude physics
- Physiology of respiration. Oxygen transport at sea level and altitude.
- Reduced work efficiency in high altitude and preventive measures
- Normal acclimatization to altitude
- Pathophysiology of altitude sickness. High altitude pulmonary and cerebral edema.
- Treatment of altitude sickness (medical, non-medical, physical). Emergency medication and emergency equipment
- Prophylaxis of altitude sickness (medical, non-medical)
- Practical exercises with emergency oxygen supply and hyperbaric chamber (Certec/ Gamov bag)

### 5.3 Safety Regulations

Frequency of training: Prior to start to work and on request if required.

- APEX safety regulations (AD-01)
- ESO safety regulations (AD-02)

### 5.4 Emergency Procedures

Frequency of training: Prior to start to work and on request if required.

- Contacts with ACHS in Calama
- Accidents
- Sickness
- Use of first aid kits
- Use of portable oxygen systems
- Use of Chajnantor emergency equipment (for overnight stays in case of bad weather)
- Fuel tank leakages

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### 5.5 Fire fighting

Frequency of training: At least one-time and afterwards on request if required.

- Use of fire extinguishers
- Use of water system at the APEX base.
- Fire in fuel tanks
- Fire at the generators
- Fire in the containers
- Fire in the antenna

### 5.6 Driving and use of car safety equipment

Frequency of training: At least one-time and afterwards on request if required.

- Check of safety equipment (AD-03)
- Driving in snow, sand, mud and ice
- Driving downhill
- Change of tires
- Installation of snow chains
- Use of radio systems
- Use of first aid kit
- Towing

### 5.7 Operation of the Antenna

Frequency of training: At least one-time and afterwards on request if required.

#### 5.7.1 Operation on site

- Safe mode
- Local drive from ACU
- Manual drive from servo cabinet
- Stowing from the ACU or from servo cabinet

#### 5.7.2 Remote observing

- Antenna safety systems

### 5.8 Operation of the cherry picker

Frequency of training: At least one-time and afterwards on request if required.

- Cherry picker safety systems.
- Use of cherry picker and operations near antenna.
- Operation procedure.

### 5.9 Use of container systems

Frequency of training: At least one-time and afterwards on request if required.

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- First aid kit
- Oxygen system
- Air condition units
- Toilet
- Water tank refill
- Use of emergency equipment (lights, food, clothes, heating, spare keys)
- Use of GPS receiver

### 5.10 Basic generator knowledge

Frequency of training: At least one-time and afterwards on request if required.

### 5.11 Handling of cryogenic liquids and gases

Frequency of training: At least one-time and afterwards on request if required.  
Course given by Indura or AGA.

- Handling of cryogenic liquids and gases, also at high altitude

### 5.12 Evacuation training

Frequency of training: Annually.

- Cooperation with ACHS/San Pedro/ALMA emergency facilities.
- Evacuation of the APEX base.
- Evacuation of the APEX telescope site.