
Site Overview

Livingston Operation and Safety Review

Mark Coles
Head - LLO

Overview

- **Technical activities at LLO are now underway by:**
 - LLO staff,
 - LIGO staff resident at Caltech, MIT, and LHO
 - LSC personnel
 - (LSU and LaTech so far, others soon - Florida, Syracuse, etc.)
 - Contract labor
 - Subcontractors
 - Visitors
- **This activity has much different character than activities done here last year, which were primarily undertaken by contractors with supervision or monitoring by LIGO.**
- **This meeting is an opportunity to assess operational and safety readiness by LLO to conduct these technical activities. (Similar objectives to LHO meeting 6/22-23/98)**

Overview (ctd)

- **We would like feedback regarding the appropriateness of policies and procedures to the work planned or now underway at LLO.**
- **Are the Safety and Operational policies and procedures:**
 - readily implementable?
 - Maintable?
 - provide personnel and equipment safety?
 - efficient and appropriate to the work scope?
- **Are there lessons learned from initial LHO experience that can be added to the material presented here?**

Range of Activities Planned or Underway

- Beam tube bake out
- Laser installation (HeNe and Nd:YAG)
- Vacuum system operation, frequent vents and pump downs to support detector installation and commissioning
- Mechanical installation
- Environmental measurements (late night and early morning activities)

Related Safety Areas

- Lock out - tag out
- Electrical safety
- Confined space access
- Laser safety
- Vacuum systems hazards (to personnel and equipment, contamination hazards)
- Cranes and rigging, material handling
- Vehicles
- Site security (theft, stray bullets, malicious acts)

Staffing

Approximate head count on site during work day

	H1 '99	H2 '99	2000
LLO staff	13	17?	22
Contract labor	4 to 5	4 to 5	0
Subcontract personnel on site	0 to 10	0 to 10	0
LSC	1 to 2	higher	much higher
LIGO from campus	2 to 4	much higher	20-30?
students	0	3 to 5	higher

Differences from Hanford

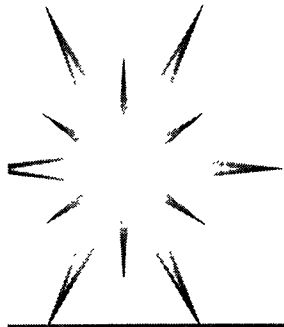
- Site environment - we are not as isolated from the community and residential areas as LHO.
 - *Negative aspects:*
 - **Vandalism (bullets, fence cutting, etc.)**
 - **intrusion**
 - **theft**
 - *Positive aspects:*
 - **Available emergency services**
 - **Major metropolitan areas (New Orleans and Baton Rouge) with broad range of services available**
 - **Educational outreach - probably more on-site visits by school children, teachers, families**

Differences from Hanford (ctd)

- LSC participation is perhaps greater here than LHO
 - LSU
 - LaTech
 - Syracuse U
 - U of Florida high power laser test bed
 - SLU magnetometer project
- Weather
 - we have already had two hurricane alerts and one site shutdown/button-up as a result of a hurricane warning

Summary

- We want to create and maintain a safe, yet accessible, environment
 - so that we can be scientifically productive
 - so that we can be a regional resource for educational outreach
- Establish models now that can be maintained and adapted as site grows, matures, and broadens range of participants and visitors at LLO

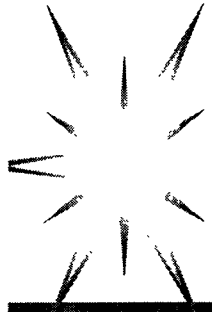


ACCESS ROAD & EMERGENCY PROCEDURES

LIVINGSTON OPERATIONS REVIEW

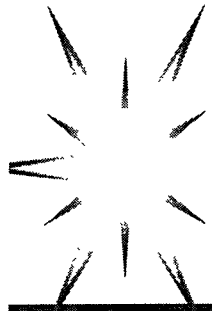
April 7, 1999

Gerry Stapfer



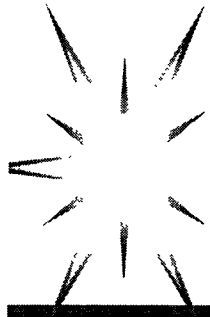
ACCESS ROAD

- TEMPORARY ACCESS ROAD
 - DIRT ROAD
 - POT HOLES
 - GRAVEL
 - COWS
 - NOT LIT AT NIGHT
 - FLOODED DURING STORMS

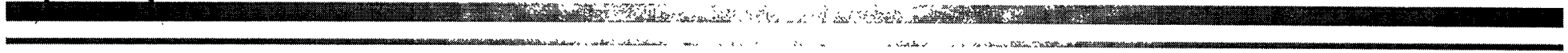


ACCESS ROAD

- PERMANENT ROAD
 - UNDER CONSRUCTION
 - DESIGNED AND BUILT BE LADT
 - FM ROAD SUBSTANDARD
 - WILL FLOOD DURING HIGH FLOODS
 - MAINTENANCE BY LIGO
 - UNFENCED (OPEN RANGE)
 - UNLIT
 - COMPLETION BY LATE FALL



ELEVATION

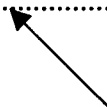


BRIGE



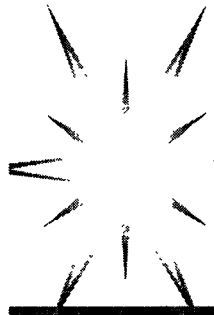
ROAD LEVEL

TEN YEAR FLOOD



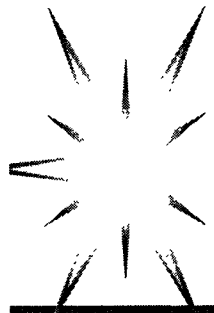
58.54

Crown	58.80
Shoulder	58.50
edge	58.40



ISSUES

- **LOW ELEVATION**
 - ROAD WILL BE FLOODED PERIODICALLY
 - MAINTENANCE COST
- **BRIDGE**
 - SUPPORT (APPROACHES) ARE GRAVEL THIS WILL ADD TO MAINTENANCE
 - BEAVER DAM WILL TEND TO CREATE A LAKE
- **RAISE ELEVATION AFTER COMPLETION**
 - DISCUSSIONS WITH NSF ARE ONGOING



EMERGENCY PROCEDURES

- FLOODING

 - ACCESS ROAD

 - EMERGENCY ACTION PLAN (M990184)

- FIRE

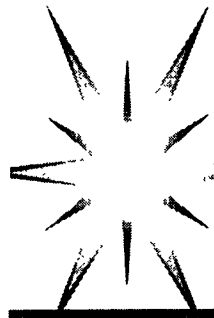
 - GENERAL FIRE ALARMS

 - FM 200 SYSTEM

 - FIRE PREVENTION PLAN (M990183)

- HURRICANES

 - HURRICANE PROCEDURE (M990185)

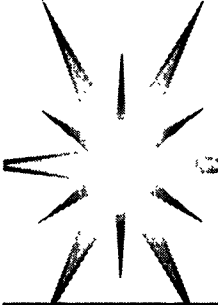


Lockout/Tagout

The Lockout/Tagout procedure establishes the minimum requirements for isolating equipment from potentially hazardous energy sources

Developed using OSHA regulations (Standards - 29 CFR)

Typ. minimal lockout procedures - 1910.147 App. A as issued by the U. S. Dept. of Labor



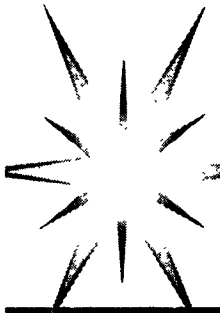
Lockout/Tagout

Lockout/Tagout is to prevent unexpected start-up of equipment or release of stored energy

Examples of potential sources:

- Electrical
- Mechanical
- Hydraulic
- Pneumatic
- Thermal

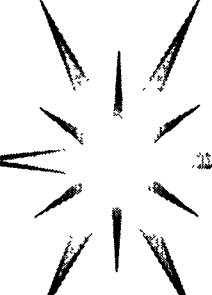
Lockout/Tagout does not cover minor adjustments or routine servicing/maintenance



Lockout/Tagout

Sequence of Lockout/Tagout

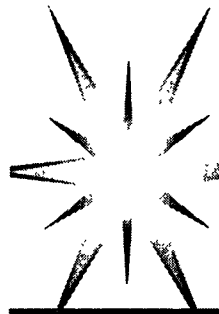
- 1.) Preparation for shutdown
- 2.) Shutdown of machine(s)/equipment
- 3.) Isolation from energy source(s)
- 4.) Applying the Lockout/Tagout device
- 5.) Release of stored or residual energy
- 6.) Verification



Lockout/Tagout

Restoring Equipment to Service

- 1.) Checkout
- 2.) Remove Lockout/Tagout device
- 3.) Notification



Lockout/Tagout

Approved devices are located in the Control Room

The Lockout/Tagout procedure does not apply to 44”
and 48” gate valves



Vacuum system hazards

- Large and heavy components

- Risk of personnel injury during movements

- risk of equipment damage from mishandling

- Large atmospheric loads (27 k lb on 48" gate valves)

- Interlock prevents large valve operation

- Small Valves (6",8",10" etc.) require operational procedure to avoid damage

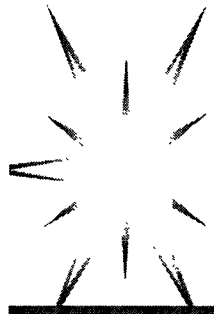
- Care in back fill & purge operational procedures

- High voltage present

- Ion pump power - maintenance of connectors

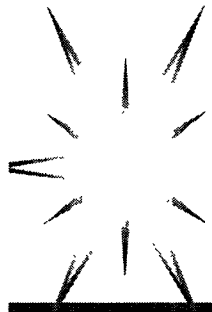
- Liquid N₂ is present (Some risk of O₂ deficiencies)

- Contamination from improper or accidental venting -procedure for vent and maintenance of purge system



Large component handling

- Hazards are
 - Contamination of system
 - Injury of personnel
 - Damage to equipment
- Hazards controlled by
 - Use of clean rooms and special covers. Proper use of gowns and covers
 - Proper procedure to handle large heavy objects and proper rigging
 - Same as above



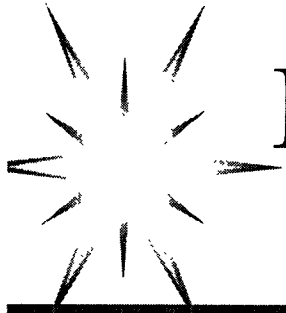
Vacuum pump down

- Hazards are:

- Contamination of system from pumps
- Gate valve damage due to high delta p
- Damage to pump carts

- Hazards are controlled by

- Oil free pumps
- Interlock and stand alone of control pump carts minimizes risk if pump fails
- Valve operation interlocks procedure which require redundant pressure measurements



Beam Tube Vent

- Hazards are
 - Contamination of beam tube
 - Over pressurization of beam tube
 - Damage to gate valves due to high delta p
- Hazard Control
 - Proper operation of dry clean air supply
 - Redundant control - air supply limited to 1.5 psi and use of 2 pressure relief valves on back to air cart
 - Valves are interlocked and procedure requires redundant pressure measurement

Livingston Laser Safety Plan As Currently Implemented

LIGO PROJECT SYSTEM SAFETY PLAN
LIGO-M950046-A-M

LIGO LASER SAFETY PROGRAM
LIGO-M960001-A-P (references ANSI-Z 136.1)
Describes the broad scale of authority and responsibilities

LIGO Livingston OBSERVATORY LASER SAFETY PLAN
LIGO-M990148
Describes the local authority and responsibilities
Site manager LIGO Safety Engineer Project Manager

Laser Safety Officer

SOP Sponsor
LIGO-M990149
LIGO 10W Laser in
Optics Laboratory

SOP Sponsor
LIGO-M990151
LIGO 10W Laser
Operating in the LVEA

SOP Sponsor
LIGO-M990159
ISC Table IR Alignment
Laser in LVEA

SOP Sponsor
LIGO-M990150
LIGO 700mw NPRO in
Optics Laboratory

SOP Sponsor
LIGO-M990158
ISC Optical Lever
Lasers in LVEA

Registered Laser Personnel

Trained (Basic) Laser Personnel



Laser Safety Officer

The LSO has the responsibility and authority to monitor and enforce the control of laser hazards at the LIGO Livingston Observatory

- **Tasks: in short**

- ›› **Maintaining list of laser inventory**
- ›› **Maintaining up-to-date listings of authorized personnel**
- ›› **Ensuring necessary safety equipment is provided**
- ›› **Providing basic laser safety training**
- ›› **Coordinating “baseline” and “termination” eye exams**
- ›› **Assisting sponsors with generating Standard Operating Procedures (SOPs)**
- ›› **Approving SOPs**

See LIGO-M960001-A-P, Section II-E, and M990148, 1.3-A for details



Standard Operating Procedures Sponsors

- Sponsors are experienced laser personnel who have a need to install a laser system.
- Sponsor should be familiar with ANSI-Z 136.1 requirements, LIGO Laser Safety Program and have completed the LIGO Livingston Basic Laser Safety Program.
- Sponsors must prepare and obtain approval of a Standard Operating Procedure for their laser system or area.
- These areas are to have restricted access, entered only by personnel authorized by the system Sponsor or the LSO.
- The names of the personnel that they authorize must be entered on the list near the entrance to the restricted access area along with their signature as the sponsor.

See LIGO-M990148, 1.3-B for details

Standard Operating Procedures Registered Laser Personnel

- Personnel needing to enter or work in this restricted access area, without an escort, need to become a Registered Laser Personnel by completing the LIGO Livingston Basic Laser Safety Training, and be provided with any additional, specific precautions, by the system Sponsor.
- Must conduct all activities in accordance with approved Standard Operating Procedures.
- Must comply with all the requirements of the LIGO Laser Safety Program.
- Must have completed the LIGO Livingston Observatory Basic Laser Safety Training Program.

See LIGO-M990148, 1.3-C for details

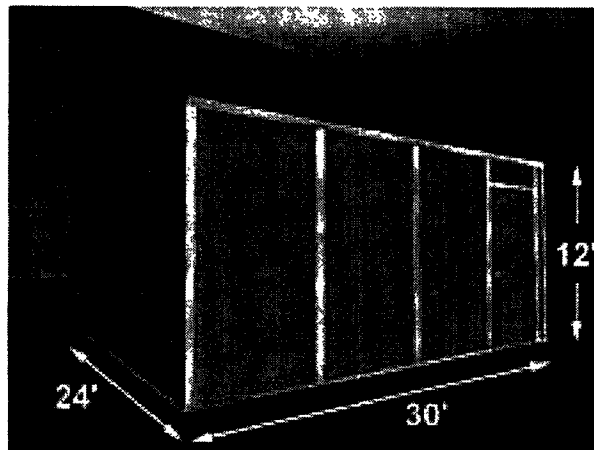
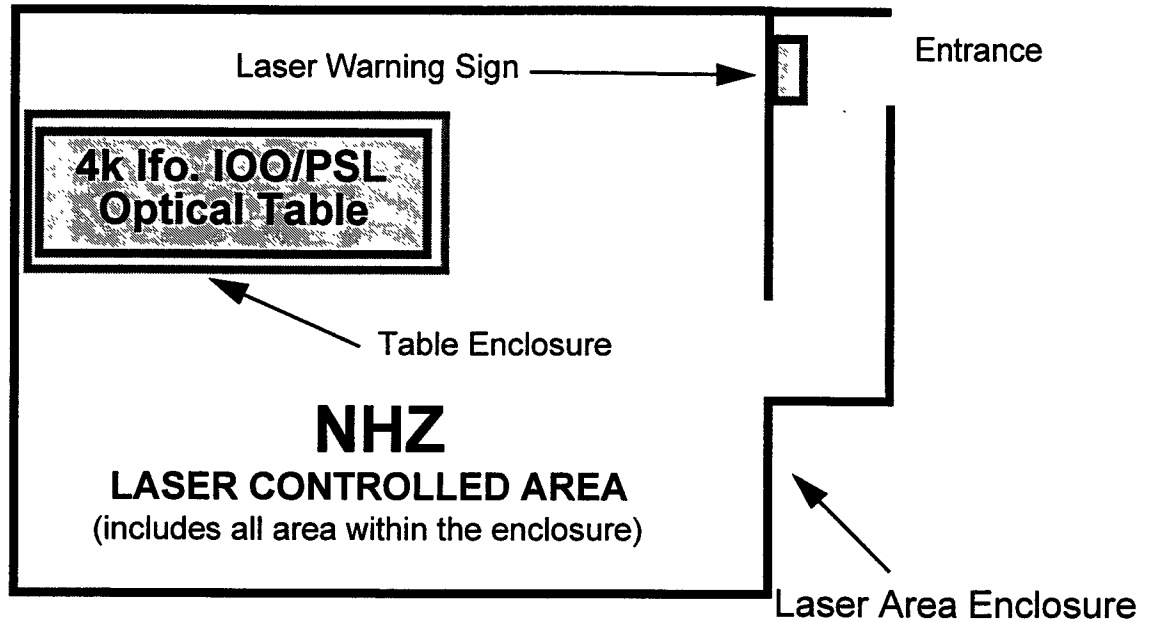
Standard Operating Procedures Basic Trained Personnel

Minimum mandatory requirements for working around lasers at the LIGO Livingston Observatory

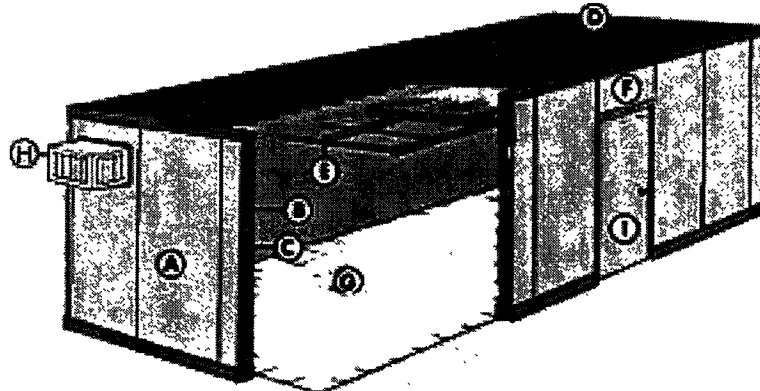
- Must have completed the required Laser Referral Eye Exam referred to as the “Baseline” eye exam. Appendix 1 of LIGO-M990148.
- Must have viewed and understood the two Laser Safety videos.
- Must understand the HAZARDS and the PERSONNEL PROTECTIVE EQUIPMENT associated with working around the LIGO laser systems.
- Must have read and understood LIGO M990148 and have a copy.
- Must have signed the Certificate of Training.
- Know the Emergency Procedures

See LIGO-M990148, 1.3-C for details

Schematic Diagram of 4k Ifo. Laser Safety Enclosure

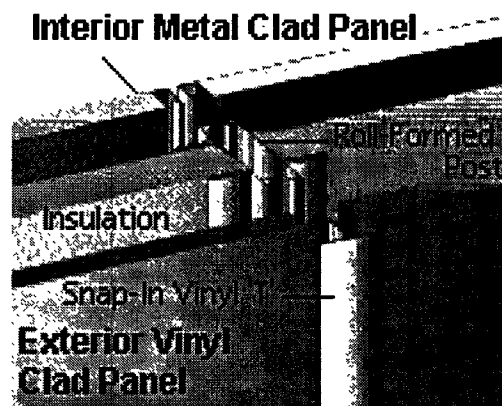


Ifo.Laser Safety Enclosure



LLO PSL Safety Enclosure

- A) Exterior Wall Panels - Vinyl laminated 1/2" gypsum board.
- B) Interior Wall Panels - Pre finished 24 gauge steel laminated 1/2" thick gypsum.
- C) Wall Construction - Cavity wall allows electrical, computer and phone lines
- D) Roof Deck - Full metal roof deck.
- E) Suspended Ceiling - Clean room qualified 2 x 4' suspended ceiling.
- F) Fascia Trim - Fascia trim hides roof deck corrugations.
- G) Flooring - Existing LVEA floor.
- H) Ventilating Unit
- I) Door - 3' x 7' steel door.



1 OPTICS LABORATORY LASER OPERATION

SAFETY RULES

The Laser Safety Officer will approve a list of people authorized to operate any of the LIGO Class 3b and Class IV Lasers. The list will be revised and re-approved whenever necessary. Other people will only be allowed to work with the LIGO Class 3b and Class IV Lasers in the presence of at least one authorized person. Under no circumstances are unauthorized personnel allowed inside the NHZ, without an escort. This includes, for example, custodians, maintenance personnel, contractors and inventory staff and visitors. A warning sign has been placed in an area prior to the entrance to the NHZ. A sign posted in an area prior to entering the NHZ, saying that entry into the NHZ is prohibited whenever the warning sign is on, except in the following cases:

- The person, or persons wishing to enter the NHZ are wearing the protective eyewear provided and have announced their intention enter the NHZ.
- The person or persons wishing to enter the NHZ have received and acknowledge approval from the operator of the LIGO Class 3b and Class IV Lasers. An up-to-date list of authorized users of the LIGO Class 3b and Class IV Lasers and current version of the SOP,s is to be posted outside of the NHZ. Personnel working with the LIGO Class 3b and Class IV Lasers are required to obey the following rules:
 - Wear protective eyewear at all times when working in the NHZ, when the laser warning sign is on, including times when the laser is placed in *STAND-BY* and the laser shutter is closed.
 - When placing components, such as mirrors or lenses, in or out of the path of a beam, a visual check shall be made to see that no one will be in harm's way. In addition, a verbal message announcing the person's intention to install or remove a component shall be made.
 - Take particular care when the person's eye level transverses the optical height of the laser beam. Situations when this may arise include, but are not limited to, bending down to pick up dropped objects and during the alignment of optical components
 - All beams are to be blocked with dumps or beam stop. Particular care should be taken that *at no time will the laser hit the curtain at the entrance to the NHZ.*
 - Scattering of laser light is to be minimized by maintaining proper alignment of the optics and thorough use of beam dumps.
 - All optical mounts are to be securely fastened to the optics table.
 - Infrared viewing equipment is available on the table, to make it possible to check for the presence of stray beams and for use during alignment of optical components.
 - The operator of the laser is to verbally announce whether the laser is to be powered on or off. Prior to powering on the laser or opening the shutter, the operator of the laser must visually confirm that no personnel will be in harms way or will be exposed to any direct laser radiation, and that all personnel present are wearing protective eyewear.
- ***DO NOT LOOK INTO THE BEAM, EVEN WHEN WEARING PROTECTIVE EYEWEAR!***

Ligo Livingston Observatory Crane Usage Guidelines

Rich Riesen

Ligo

Introduction

- The purpose of this procedure is to establish the rules for the use of the building cranes, the responsibility for rigging, and the responsibility for rigging equipment**
- Reference Document JPL Spec. ES501492-Safety Requirements for Mechanical Support Equipment**

Topics of Discussion

- **Crane Information**
- **Personnel Hazards**
- **Equipment Hazards**
- **Crane Usage Guidelines**
- **Rigging Equipment Guidelines**
- **Rigging Guidelines**

Crane Information

- The LVEA floor area is covered by a system of four five-ton capacity under-hung cranes**
- The large equipment access area for the LVEA is served by a single five-ton under-hung monorail crane**
- The two VEA areas (End Stations) are each covered by a single five-ton capacity under-hung crane**

Crane Information

- All Cranes are equipped with end-stops and micro -inching capacity**
- The four cranes in the LVEA are equipped with proximity controls to prevent them from colliding with each other**
- The LVEA cranes were installed for crane to crane load transfer**
- Remote operation (Radio Control) for all cranes is being investigated to improve safety and operator ease**

Personnel Hazards

- **Insufficient strength of slings**
- **Swinging load**
- **Load hitting loose objects that might fall**
- **Tripping hazard**
- **Load shifting**

Equipment Hazards

- **Dropping Equipment**
- **Swinging load impact on walls and other equipment**
- **Incorrect slinging or improper use of spreader bar**

Crane Usage Guidelines

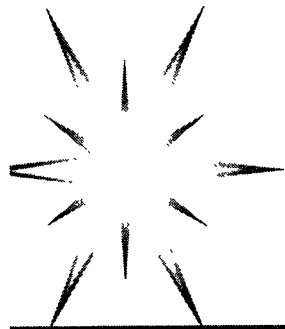
- **Demonstrate ability to operate cranes by completing the crane operator's certification course**
- **Usage of Tag-Lines and staying out from under the load**
- **Operator must be able to see the load at all times**
- **Never bypass any of the crane safety systems**

Rigging Equipment Guidelines

- Only use rigging equipment that has been inspected and certified**
- Prior to use, conduct a visual inspection for any damage**
- Rigging equipment is for rigging purposes only**

Rigging Guidelines

- Use appropriate load rating rigging equipment**
- Do not lift loose items on a pallet**
- Any special set up must be approved by the Site Manager**



BEAM TUBE

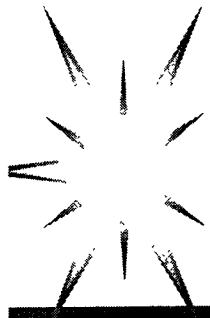
BTE ACCESS AND BAKE OUT

LIVINGSTON OPERATIONS

REVIEW

APRIL 7, 1999

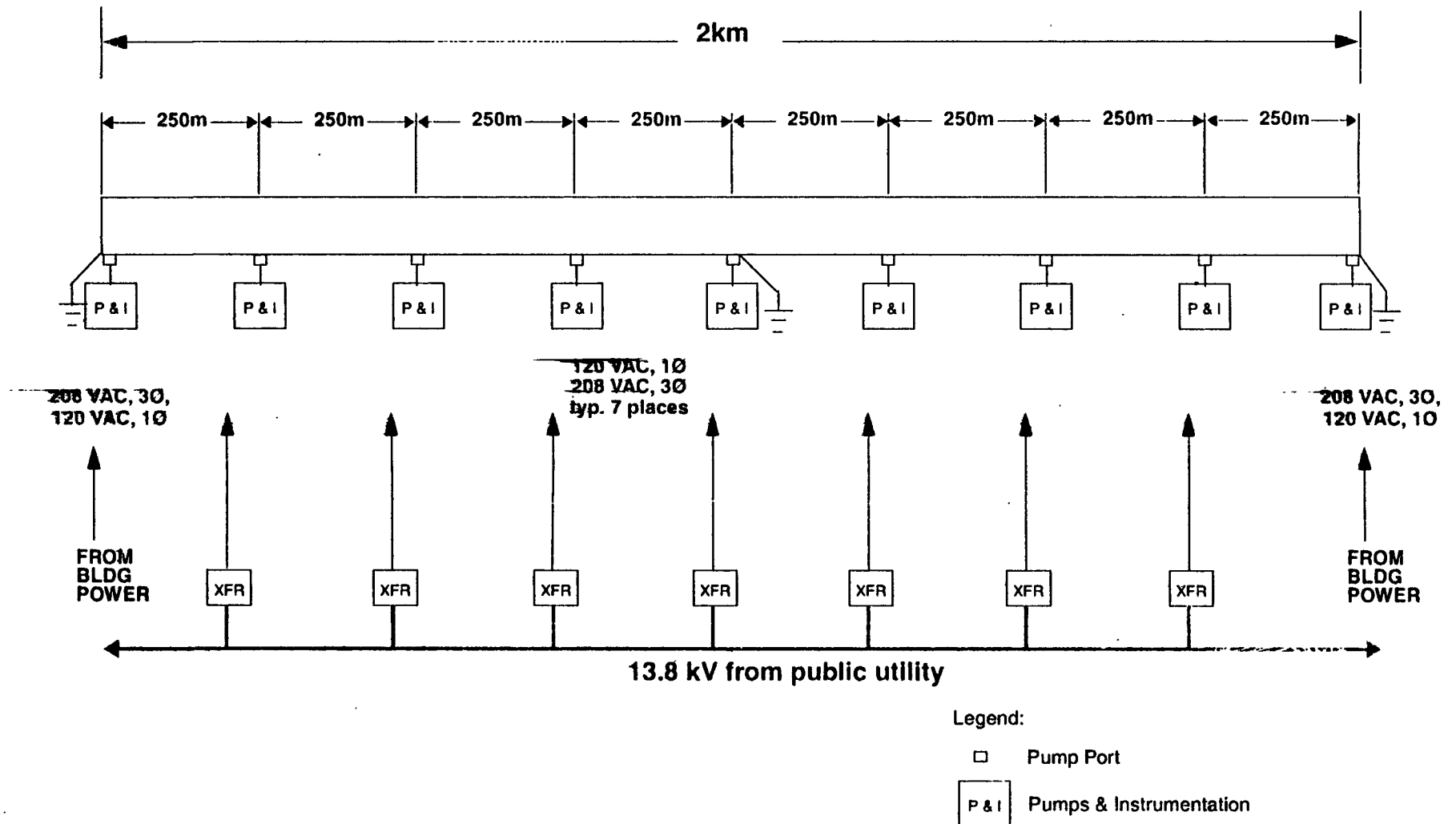
CECIL FRANKLIN

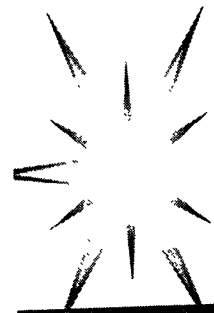


Livingston Safety B.O. Review

- (BTE) Entry/Egress Procedure
- (BTE) Entry During Beam Tube Bake out Operation
- D.C. Power Supply Emergency Shutdown
 - B.T. Bake out concept/objective is the same as Hanford
 - All Bake out equipment will be shipped to LLO
 - *Different operation at LLO*
 - Bake temp. will be 168c (150c at Hanford)
 - Lights are hung from the BTE wall above the B.T.
 - Sequence will be LX2,LX1,LY1,LY2,opposite of Hanford

ELECTRICAL POWER FOR HEATER JACKETS, PUMPS AND INSTRUMENTATION





BT ACCESS/EGRESS

➤ PROCEDURE

- BASED ON LHO PROCEDURE
- LIGO-M990193-00-M

➤ EQUIPMENT REQUIRED

- STROBE LIGHT
- PORTABLE WORK LIGHT
- SAFETY CONE

➤ AUTHORIZATION

- SITE MANAGER

Portable Work Light



© 1998



Procedure Overview

LLLO Beam Tube Enclosure (BTE)

Entry/Egress M990193-00M

- BTE location for the work planned
- Portable work lighting
- Verify acceptable condition prior to BTE entry
- Verify sufficient battery power
- Install an operating strobe light
- Secure door open with *Locking Mechanism*
- Verify BTE is clear of smoke or unusual odor
- Avoid contact with snakes and spiders
- Procedure # LIGO-M990187-00m
- Notify Bake out Manager

➤



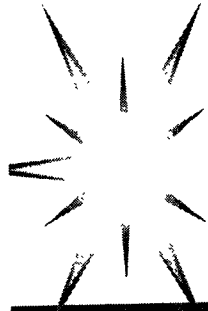
Procedure Overview

LLO Beam Tube Enclosure (BTE) Entry

During Beam Tube Bake out Operation

#M990192-00-M

- Specifies safe action to enter/exit (BTE)
- When BT is connected to DC power Supply
 - DC voltage up to 80volts
 - Temperatures up to 168° C (335° F)
 - BTE entry doors have special lock tumblers installed
 - keys controlled by the Bake out Operator
 - **This procedure identifies three classes of BTE entry**
 - **Entry “A”**
 - **Entry “B”**
 - **Entry “C”**



Procedure #M990192-00-M

➤ SECTION A

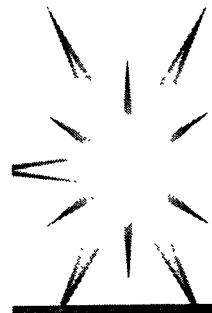
- UNRESTRICTED ENTRY FOR PORT 5
- BT VOLTAGE DOSE NOT EXCEED 7 VDC
- MONITOR AND CALIBRATE RGA

➤ SECTION B

- BAKE POWER ON
- RESTRICTED ENTRY LIMITED TO DOORWAY
- MONITOR EQUIPMENT AND LOG BOOK ENTRIES

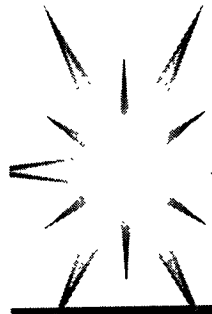
➤ SECTION C

- BAKE POWER OFF
- UNRESTRICTED ENTRY
-



BTE Entry “A”

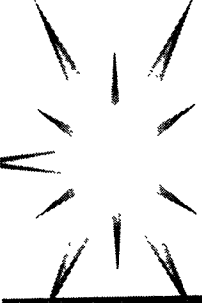
- Single doors **adjacent** to the buildings
- Port xx5 Or Port xx6 (RGA)
 - Authorization (Bake out Supervisor)
 - Portable Work Lighting
 - Verify Acceptable Condition
 - Battery Powered Work Lighting
 - Secure door *Locking Mechanism*
 - Return Check List



BTE Entry “B”

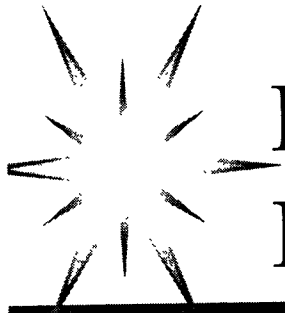
- Power Supply Trailers energized
- Restricted to the doorway of the type “A” or type “B” enclosure.
 - Authorization Bake out Supervisor
 - BTE location for work planned
 - Sign out with Bake out Operator
 - Must call Bake out operator prior to entry and exit
 - Return Check list

➤



BTE Entry “C”

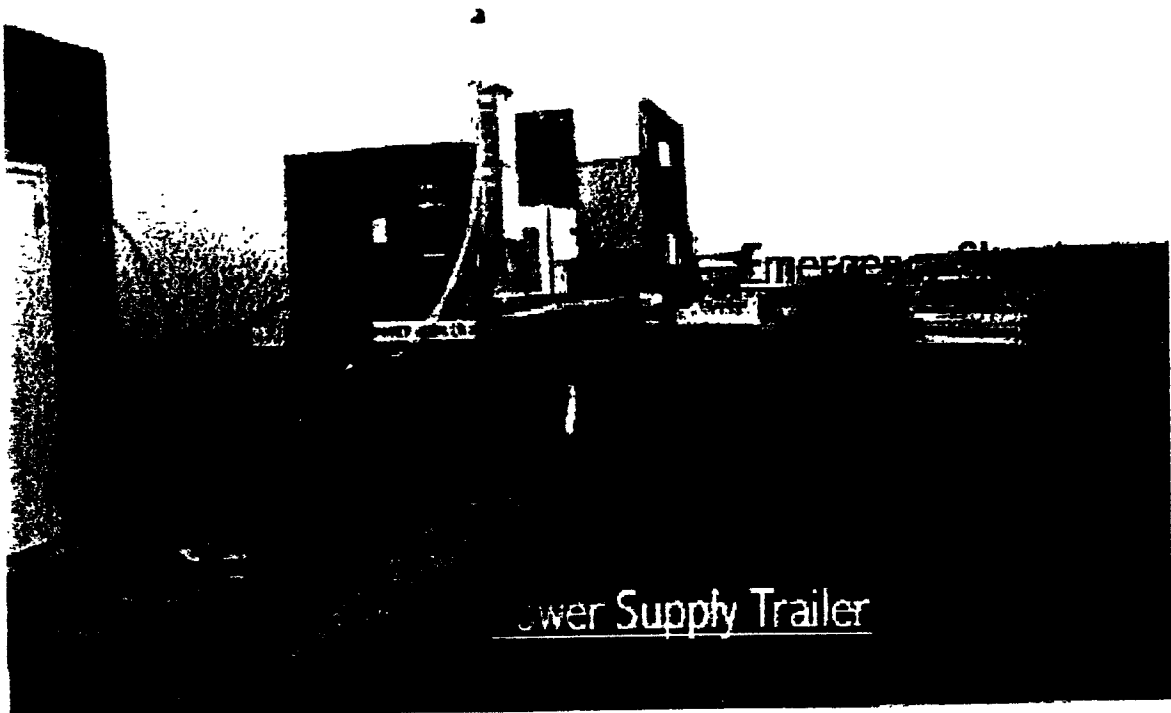
- DC power supplies are “Off” and locked out prior to entry.
- All entries shall be carefully pre-planned to minimize access time
- Required pre-approved by the Bake out Supervisor
 - Portable Work Lighting
 - Secure the entry door open with the *Locking Mechanism*



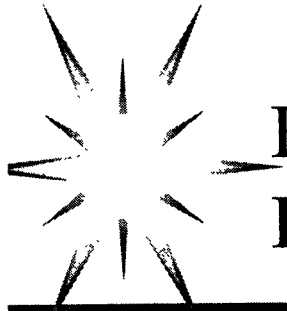
PROCEDURE # M-990191-00-M

Emergency Shutdown

- Provide shut down of bake power in
- case of a Emergency
 - shutdown form B.O. operator console
 - shutdown if no B.O. operator available

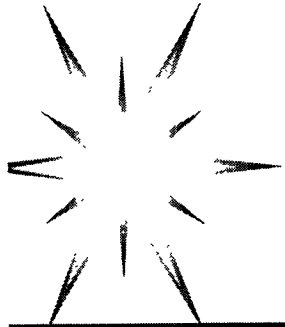


Power Supply Trailer



Beam Tube Bake out DC Power Supply EMERGENCY SHUTDOWN # 990191-00-M

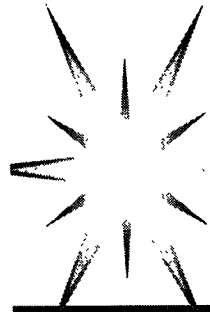
- **At the bake out control console (Bake out Operator only)**
 - Select the power supply control screen.
 - Click the “OFF” button.
 - Confirm that the power supply currents fall to zero.
 - If the indicator for either power supply current fails to go to zero,
 - proceed with step b
 - Go to each power supply and press the EMERGENCY OFF button (main circuit breaker trip) near the front end of the power supply trailer on the road side.



VISITOR SAFETY & TRAINING

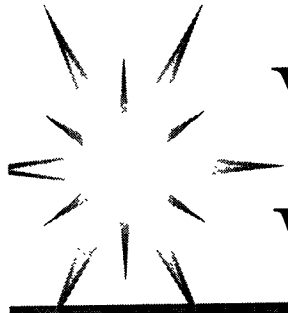
LIVINGSTON
OPERATIONS REVIEW

APRIL 7, 1999
GERRY STAPFER



VISITORS (NON-WORKING)

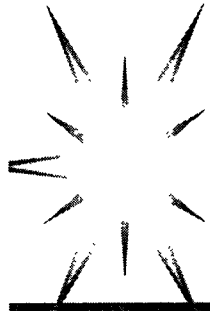
- VISITORS ARE WELCOME ANY TIME
 - VISITORS MUST BE ESCORTED IN ALL AREAS OTHER THAN OSB
 - LVEA AND LASER AREA REQUIRES WORK PERMIT IN ADDITION TO ESCORT
 - GROUP VISITS MUST BE SCHEDULED IN ADVANCE



VISITOR SAFETY

WORKING VISITORS

- VISITOR INFORMATION SHEET
 - MUST BE SIGNED AND FILED
- EMPLOYEE CHECKLIST
 - MUST BE SIGNED AND FILED
 - BRIEFING/ORIENTATION ITEMS WILL VARY DEPENDING ON JOB DESCRIPTION



TRAINING

- **LASER SAFETY TRAINING**
 - IN HOUSE SAFETY MOVIES REQUIRED
- **FORKLIFT OPERATORS**
 - LLO PERSONNEL ATTEND FORMAL TRAINING GIVEN BY NATIONAL SAFETY COUNCIL
- **CRANES**
 - CRANE TRAINING CLASSES ARE BEING SCHEDULED THROUGH CRANE INSTITUTE

LIGO LIVINGSON OBSERVATORY INCOMING EMPLOYEE/VISITOR CHECKLIST

EMPLOYEE/VISITOR NAME		FORWARDING ADDRESS	TELEPHONE NUMBER	LIGO LOCATION	HIRE DATE/VISITOR START DATE	
SOCIAL SECURITY NUMBER OR FOREIGN VISITOR'S PASSPORT NUMBER				GROUP		
INCOMING BRIEFING/ORIENTATION MADE BY			ENTER NAME OF RESOURCE/CONTACT PERSON.	<u>NOT REQUIRED</u> DRAW DIAGONAL LINE, IF NOT APPLICABLE	<u>BRIEFING/ORIENTATION COMPLETED BY:</u>	
SIGNATURE _____ (EXT.) _____					SIGNATURE	DATE
BRIEFING/ORIENTATION ITEM		CONTACT OFFICE				
1.	Human Resources - Employment/Visitor/Info (Incoming Interview & ID Card)	Observatory Manager/ LIGO Administrator				
2.	Human Resources Info - Timekeeping Requirements	Observatory Manager/LIGO Administrator				
3.	Tools, Uniforms, Clothing, Phone Usage, Credit Cards, etc.	Site Manager/LIGO Administrator				
4.	LIGO Safety Briefing	LIGO/Site Safety				
5.	LIGO Laser Safety Briefing Base Line Eye Exam	LIGO/Site Safety, LSO				
6.	Operations Procedure Requirements/Constraints	Site Manager/Group Leader/ LIGO Administrator				
7.	Administrative System and Site Security	Site Manager/LIGO Administrator				
8.	LIGO/Site Property Requirements	LIGO Property Representative				
9.	Locks and Keys	Site Manager/LIGO Administrator				
10.	Site Vehicle Use	Site Manager				
11.	Purchasing Procedures and Credit Cards	Site Manager/LIGO Administrator				
12.	Computer Accounts, Passwords Computer/SW Use Policies/Constraints	LIGO Network Administrator				
13.	Travel Policies, Travel Profile	LIGO Travel				
14.	Credit Union Information	LIGO Administrator				
15.	DCC Policies LIGO Documentation and Numbering Procedures/Policies	LIGO DCC				

Employee Signature

Date

LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY

Prepared by: Gerry Stapfer Approved: <hr style="width: 100%;"/> Site Operations Manager, Livingston Site	Document Type LIGO-M990182 -00-M03/01/99 VISITOR INFORMATION Working At LIGO Livingston Observatory	Approved: Approved: Approved:
---	--	---

1. A **TECHNICAL LIAISON** is assigned to all visitors coming to work at the LLO. Visitors are responsible to: (1) request a **TECHNICAL LIAISON** be assigned to them; (2) direct this request in advance of their visit to the Observatory Head, and (3) use the **TECHNICAL LIAISON** to help coordinate and facilitate their activities during their stay. **NOTE:** the Observatory Head will also serve in whatever capacity is required when other responsible parties are unavailable.
2. **OVERALL SAFETY RESPONSIBILITY** at LLO, is assigned to the Observatory Manager, Gerry Stapfer.
3. **INCIDENT AND ACCIDENT REPORTING:** A visitor shall immediately notify and promptly report any incident, accident or laser exposure resulting in hardware or property damage, injury or fatality, or contamination of property or environment.
4. **ALL VISITORS** must read, and maintain familiarity with the following documents:

 Emergency Action Plan, LIGO-990184-00-M
 Lock & Tag Procedure, LIGO-990190-00-M
5. **RESTRICTED AREAS:** Visitors are allowed unescorted access to these areas only if: (1) they have read and agree to all provisions of the appropriate governing documents; (2) they have made arrangements with the appropriate contact persons. **NOTE:** Certain provisions of these plans (e.g., baseline eye exams) should be completed in advance of your visit.
6. **RESTRICTED EQUIPMENT (not to be operated without authorization)**

 Overhead Cranes, Diesel Forklift, Electric Forklifts, Trailer, High Lift, Wood and Metal shop equipment
7. **USE OF LLO VEHICLES:** A copy of Drivers License must be in LLO files 48 hours prior to use of any LLO vehicles. Seatbelts must be worn at ALL times. Smoking is NOT PERMITTED in LLO vehicles.
8. A **WORK PERMIT** system is used at LLO to coordinate all activities. Any activity that can affect, interfere with or be disrupted by other operations on site, requires a work permit. Open work permits are reviewed and new permits are issued at the daily work briefing.
9. **REQUIRED SAFETY EQUIPMENT:** LLO will provide (1) non-prescription laser safety goggles or safety glasses, hard hats, and gloves for visitors requiring this equipment. (2) If an activity requires safety shoes (e.g., lifting items in excess of 35lbs.), visitors must supply their own approved safety shoes (ANSI Z41). (3) For all other safety equipment that may be needed, see Gerry Stapfer for details.
10. **CUSTOM SETUPS / EXPERIMENTS:** Prior to initiating a custom setup/experiment, and again prior to energizing the set-up/experiment, see Gerry Stapfer to ensure compliance with all safety and other observatory practices.
11. **RESPONSIBLE CONTACT PERSONNEL:** Prior to working with the following systems or labs, see the responsible person listed:

Laser, Optics, Vacuum Assembly Vacuum System Electrical/Electronic Systems General Computing Material Handling	Jonathan Kerr Allen Sibley Rusyl Wooley Tom Evans Gerry Stapfer
--	---

I am familiar with the information contained herein and in the cited documents. _____
Signature