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Laser Safety Audit and Inventory System Database

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Laser Safety Audit and Inventory System Database

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Abstract

A laser safety auditing and inventory system has been in use at Sandia National Laboratories – Albuquerque for the past five years and has recently been considered for adoption by Sandia National Laboratories –Livermore. The system utilizes the “Microsoft Access” database application, part of the Office 2000 software package. Audit and inventory data is available on-line for ready access by laser users. Data is updated weekly to provide users with current information relating to laser facility audits and laser inventories.

I. Introduction.

The requirement for the “Periodic Laser Safety Reviews” specified by the Environment, Safety and Health (ES&H) Manual, Chapter 6G (lasers and intense light) requires:

“Managers, laser owners, or their designated DLSO shall assist the LSO in conducting a periodic inventory and safety review of class 3b and 4 lasers, and correct any deficiencies noted in the safety review.”

This periodic inventory and safety review is accomplished through an annual auditing of Sandia National Laboratories (SNL) laser facilities and the inventory of Class 3b & Class 4 lasers for compliance with the ANSI Z136.1 Standards.

The “Periodic Laser Safety Review” was initially driven by the Laser Safety Officer (LSO) Specific Responsibilities requirements of ANSI Standard Z136.1-1993 (1.3.2.8).

II. Database

A. Program Application

The Laser Safety Auditing and Inventory System database utilizes “ACCESS”, a database application of Microsoft Office ©. Initially the database was created using MS Office ’97 ©, but was later converted to MS Office 2000 ©.

B. Database Structure

The laser safety audit and inventory database has two parts or tables: the Laser Information Table and the Laser Safety Audit Table.

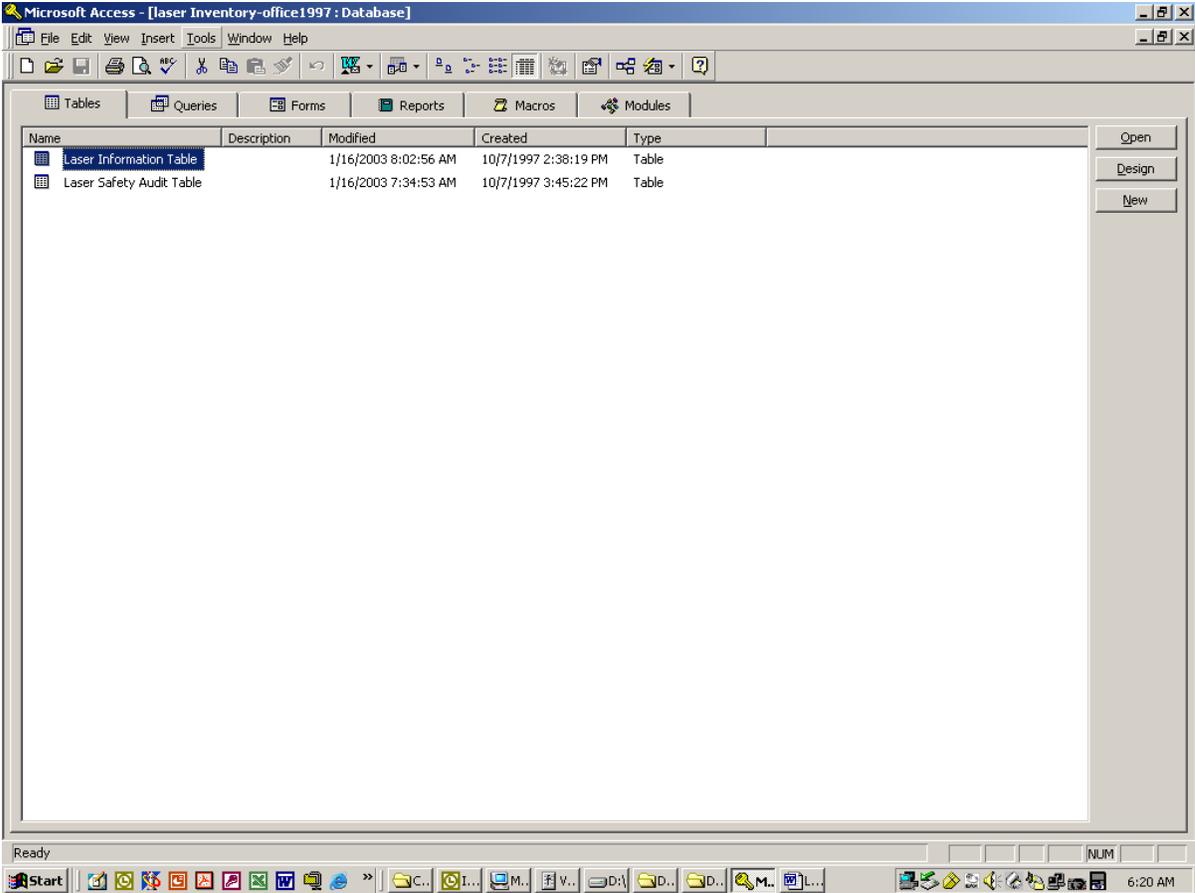


Figure 1
Database Tables

1. Laser Information Table

This part of the database can be considered the SNLA inventory of Class 3b and Class 4 lasers. The Laser Information Table contains data specific to each individual laser. Each laser tracked by this system is assigned a unique identification number (ID), which is serialized.

A sticker (sample shown below) with a laser ID number is attached to each Class 3b and Class 4 laser at the time it is entered into the inventory. Use of this laser ID sticker speeds up the inventory process since the laser parameters and data are captured once and stored in the laser information table of the database.



Figure 2

Sample Class 3b or Class 4 Laser Identification Sticker

The laser ID label allows for fast and efficient updates and inventory of lasers even when they have been moved. Only the location and the user need be updated in the inventory.

The information associated with any particular laser of concern is stored and maintained in the Laser Information Table of the Laser Safety Audit and Inventory Database.

The table structure (information list) of the Laser Information Table in the database is presented below, followed by the structure for the Laser Safety Audit Table.

The laser “control number” (unique laser ID number) is the key field. Only one number for the laser ID can exist in the Laser Information Table of the database. In like fashion the “record number” is the key field for the Laser Safety Audit Table of the database.

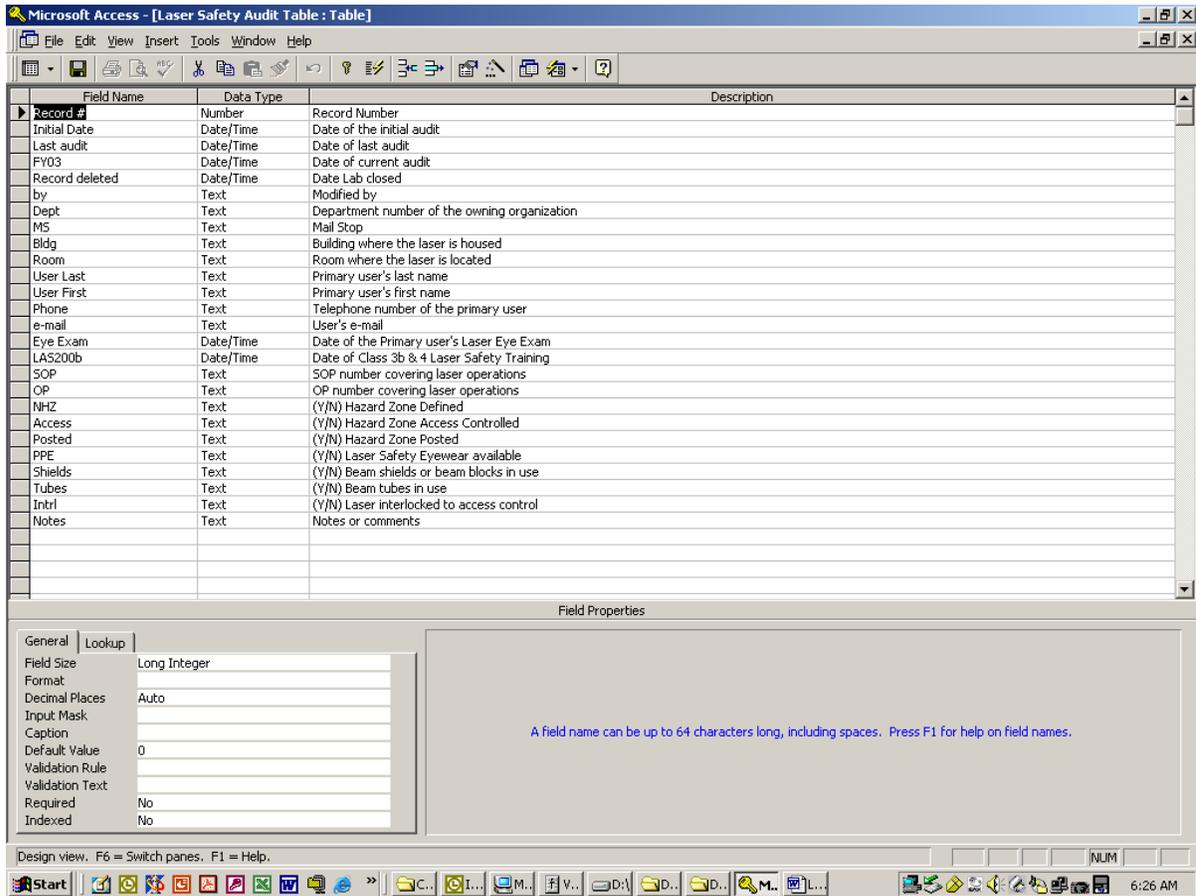


Figure 3

Access Table Design View

Table Structure For “Laser Information Table”

Index	Field Name	Data Type	Notes
	1st Inventoried	Date/Time	Date the initial inventory was conducted
	Last Inventoried	Date/Time	Date item was last Inventoried- Previous FY
	FY##	Date/Time	Date item was Inventoried for current FY
	Deleted	Date/Time	Date item was deleted
	By	Text	Who modified the database, initials
Key	Control #	Text	Unique item identifier (ID number)
	Manufacturer	Text	Laser Manufacturer's Name
	Model #	Text	Laser Model Number
	Serial #	Text	Manufacturer's serial number of the laser
	Property #	Text	SNL property # (S, R or V number)
	Class	Text	Laser Hazard Class
	Description	Text	Description of the laser
	Lambda	Text	Primary Wavelength in use (nanometers)
	Output	Text	Maximum output of the laser
	Power	Text	CW Power in Watts
	Energy	Text	Pulse Energy in Joules
	Width	Text	Pulse duration
	Hz	Text	Pulse Repetition Frequency or Rate
	Exit	Text	Exit aperture of the laser in millimeters
	Theta	Text	Beam Divergence in milliradians
	Date	Date/Time	Date Manufactured
	Label	Text	(Y/N) Labeled, Certified, Class Warning
	CFR1040	Text	(Y/N) CFR1040 compliance label
	Intlk	Text	(Y/N) laser interlocked to access control
	OD vis	Text	OD minimum for Visible Lasers - 0.25 second exposure
	OD inv	Text	OD minimum for Invisible Lasers - 10 second exposure
	OD req	Text	Required OD of laser eyewear
	OD avil	Text	Optical Density of eyewear available for use
	Alert	Text	Y (yes), - (no), I (inactive), S (storage), O (on order)
	Status	Text	Laser Status (active/inactive)
	Mod	Text	(Y/N) Laser Modified from Manufacturer's Specifications
	Bldg	Text	Building which houses the laser
	Room	Text	Room or Lab number where the laser is located
	MS	Text	Mail Stop of User
	Dept	Number	Department Number
	DLSO last	Text	Deputy Laser Safety Officer responsible for this laser, Last Name
	DLSO first	Text	DLSO's first name
	Phone	Text	Telephone number
	e-mail	Text	e-mail address
	User Last	Text	Primary Laser User's/Operator's last name
	User First	Text	Primary Laser User's/Operator's first name
	Number	Text	Primary Laser User's/Operator's telephone number
	Notes	Text	Notes about laser

2. Laser Safety Audit Table

The “Laser Safety Audit Table” of the database pertains to the laboratory or facility housing the laser, the primary user, and hazard controls.

Table Structure For “Laser Safety Audit Table”

Index	Field	Data Type	Notes
Key	Record #	Number	Record Number
	Initial Date	Date/Time	Date of the initial audit
	Last audit	Date/Time	Date of last audit
	FY##	Date/Time	Date of current audit
	Record deleted	Date/Time	Date Lab closed
	By	Text	Modified by
	Dept	Text	Department number of the owning organization
	MS	Text	Mail Stop
	Bldg	Text	Building where the laser is housed
	Room	Text	Room where the laser is located
	User Last	Text	Primary user's last name
	User First	Text	Primary user's first name
	Phone	Text	Telephone number of the primary user
	e-mail	Text	User's e-mail
	Eye Exam	Date/Time	Date of the Primary user's Laser Eye Exam
	LAS200b	Date/Time	Date of Class 3b & 4 Laser Safety Training
	SOP	Text	SOP number covering laser operations
	OP	Text	OP number covering laser operations
	NHZ	Text	(Y/N) Hazard Zone Defined
	Access	Text	(Y/N) Hazard Zone Access Controlled
	Posted	Text	(Y/N) Hazard Zone Posted
	PPE	Text	(Y/N) Laser Safety Eyewear available
	Shields	Text	(Y/N) Beam shields or beam blocks in use
	Tubes	Text	(Y/N) Beam tubes in use
	Intrl	Text	(Y/N) Laser interlocked to access control
	Notes	Text	Notes or comments

C. On-Line Access

The database is available, on-line, to all SNL employees through the local area network. The database resides on a computer connected to SNL net and is available 24 hours a day, seven days a week. Laser users have access and can search the database to locate specific lasers or laser types.

In many cases laser users have found “inactive” lasers in the database, which were then borrowed, eliminating the need to purchase a new laser for a particular task.

The location address of the Laser Safety Audit and Inventory Database is presented in the body of the e-mail (sent to laser users, DLSO, LSO and the ES&H coordinator), which documents the finding of the laser safety audit and inventory conducted at a laser lab or facility.

The laser safety audit and inventory of a laser lab or facility is documented in an email provided to the concerned personnel (ES&H owner, DLSO, LSO and others) within 48 hours of the site visit.

III. Conclusion

The Laser Safety Audit and Inventory database is critical to the laser safety program at Sandia National Laboratories – Albuquerque, New Mexico. It is a convenient method of collecting, updating and maintaining information on Class 3b and Class 4 lasers as well as information on the various laser labs and laser facilities.

IV. Reference

ANSI Std. z136.1-2000: for Safe Use of Lasers, Published by the Laser Institute of America

MN471001, Environmental, Safety, and Health Manual, Chapter 6G: Lasers and Intense Light.

V. Term and Abbreviations

ANSI	American National Standards Institute
DLSO	Deputy Laser Safety Officer
ES&H	Environment, Safety and Health
FY	Fiscal Year
ID #	Identification number
ISMS	Integrated Safety Management System
Hz	Hertz (sec^{-1})
LSO	Laser Safety Officer
MS	Mail Stop
PHS	Preliminary Hazard Screening
SNL	Sandia National Laboratories
SNLA	Sandia National Laboratories- Albuquerque

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