Site Wide Industrial Hygiene

Site Wide Industrial Hygiene Database

LOCKHEED MARTIN

Site Wide Industrial Hygiene Database

Executive Summary

There are 2 major forces driving the need for a comprehensive site-wide information management system for industrial hygiene; 1) 10 CFR 850- the Chronic Beryllium Disease Prevention Program and 2) 10 CFR 851- the Worker Safety and Health Program. The key elements from these documents which the site-wide industrial hygiene system will address are;

- Assessing exposure hazards before work activities are conducted and utilizing control measures, monitoring equipment, and personal protective equipment to protect human health and the environment;
- Maintaining a record keeping system for exposure records that protects the confidentiality of workers while allowing the records to be transmitted to U.S. Department of Energy (DOE) upon request;
- Identifying facilities where hazards have been used and assessing the potential for exposure and maintaining this facility list;
- Implementing an exposure reduction and minimization program to maintain exposure as low as practicable based on measured exposure levels; and
- Assessing the effectiveness of the exposure control programs, noting areas for improvement and providing performance feedback to affected workers and groups.

The Site Wide Industrial Hygiene Database system is intended to serve as a single site-wide location for Industrial Hygiene information that will provide an effective means for the site contractors to meet these requirements.

The key elements of the system include;

Access to data: Today accessing data across the site is time consuming, costly and in some cases impossible.

Easy to use: The system needs to help individuals do their job. This lowers the cost of operation and improves quality. Features like online help, wizards with step by step processes and intuitive design aligned with industry standards will make the system easy to understand and use.

Flexible: Each company does work differently. The system needs to integrate well with the work flow for each company, not get in the way of getting the job done.

Secure: Empower the customer to do their jobs. Open what needs to be opened, but lock what needs to be locked down.

Lessons learned have taught us that it's not just a matter of getting the data down on a sheet of paper and storing the paper away, but rather getting the data loaded into an intelligent integrated system, one where data can be retrieved (data-mined) by area, hazard, similar exposure group, individual, or anything needed to support the customer. The system will assist in planning future work and budgets by providing tools to conduct statistical analysis and historical trending.

The SWIHD system will offer exposure assessments, records maintenance, facility hazard lists, employee notifications, and affected worker tracking. It will be flexible and conform to each company's way of doing business while collecting and processing the key data and meet the need to retrieve this critical information across time and contracts. It will offer each company a tool tailored to their workflow. It will take advantage of new technologies and will manage the flow of data keeping it accurate, precise, and up to date.

Security is not by chance, but rather by direction. The security of the system will permit easy access to authorized personnel, giving them the correct level of permission within their area.

The Industrial Hygiene system used today at Tank Farms is a good system and serves as the baseline for the Site Wide Industrial Hygiene system. The Tank Farms system, expressly created to meet the needs of Tank Farms, is great for Farms and Tanks, however, it is not so good for large numbers of buildings, wells and trenches.

The Site Wide system will offer a single location for accurate and up-to-date Industrial Hygiene information, affording opportunities which do not exist today to retrieve information immediately for management reporting, medical assistance, and work conditions monitoring.

It will serve as an invaluable resource in the mission to protect human health and the environment

Site Wide Industrial Hygiene Database Committee

Goal:
Create a contractor tailored system to collect, monitor, manage, report and record (create permanent record) Industrial Hygiene data to meet the requirements of the customer.

Objectives:
- Provide information to Perform statistical analysis
- Simplify the process of data capturing
- Be able to add a new survey type as needed
- Contractors need access (high speed – web)
- Establish a formal rule book administration authority, roles, access, etc.
- Flexible reporting and data mining
- Occupational Exposure Limits (OEL) at time of sampling needs to be carried forward into the permanent record
- Each portal needs to be contractor specific with a core of shared functionality
- Each contractor will see just their filtered set of data
- Doe needs a system that they can retrieve data (name/hid # driven) where, when, how, what an individual was exposed to.
- Return exposure results and tie it to sample, individual, and location

Issues/Concerns:
- Needs to interface with Site Occupational Medical Contractor (SOMC)
- User training
- Access from outside of HLAN. Is it necessary?
- Historical data – will legacy data be integrated into the system?
- 18-24 months Washington Closure Hanford (WCH) will have a very limited need
- Security requirements
- Software QA
- Software Control
- Chief Information Officer (CIO) process (form registration, etc.)
- Policies and processes
- Exposure assessment needs to be added – Washington River Protection Solutions, LLC (WRPS)
- Configuration control – system must be aware of locations even if the specific building has been removed
- Access to site-wide data. Who can? Who can't?

Site Wide Industrial Hygiene Database (SWIHD)

Software Requirements Specifications

Developed for

Mission Support Alliance (MSA)

Washington Closure Hanford (WCH)

Washington River Protection Solutions (WRPS)

CH2M HILL Plateau Remediation Company (CHPRC)

Advanced Medical Hanford (AMH)

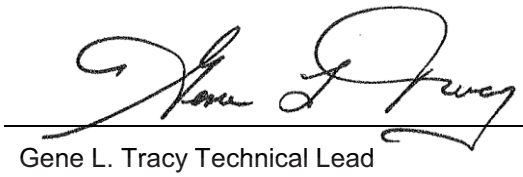
Department of Energy (DOE)

Prepared by

Lockheed Martin

APPROVALS

This document has been reviewed and approved for use in the project development process. Minor changes and corrections may be made to this document without re-approval.



Date: 8/2/10

Gene L. Tracy Technical Lead

Date: 8/2/10

T.G. Ibsen, Technical Authority Manager

Revision History

Version #	Date	Change Author	Description
0.0	July 20, 2010	Tracy, GL	Initial release.
1.0			Complete revision.
2.0			Complete revision.
2.0			Yearly review
3.0			

Contents

1.0 INTRODUCTION

This document provides the requirements for the site-wide Industrial Hygiene system at Hanford to record and track individual exposure information along with work performed by location, employees and all samples collected by date and time. The Site-Wide Industrial Hygiene Database (SWIHD) application will record and track sample data from Direct Reading Instruments, air samples, surface samples, bulk samples, noise samples, heat stress and or any other samples needed for supporting the operations at Hanford.

1.1 Purpose

This requirements specification document contains the general requirements for the SWIHD application. Section 2 of this document provides a system description and lists the interfaces. Section 3 outlines the functional, performance and operational requirements for the SWIHD application. Specific requirements are listed in the SWIHD Requirements Traceability Matrix database (RTM).

The SWIHD application uses various technologies for collecting and recording sample information into a site-wide database for easy retrieval. This requirements specification will provide guidance for development and enhancement to application developers.

1.2 Scope

The SWIHD application can be divided into three main areas. These areas include flexible menu/navigation Portals for each contractor on site, site-wide database to serve as a single repository and a reporting / ad hoc set of tools to allow the customer to easily retrieve information.

The Portals allow each contractor to have their own unique graphical user interface into the system accessing a single site-wide database while maintaining a secure controlled environment, protecting access to information based upon contractor need and role. The Portals will align with each company's workflow requirements as well as the look and feel needs of the contractor while providing validation checking of data entered into the system. In addition the system will also address any data transfer issues as needed to support the integrity of the site-wide repository.

The database/repository accommodates all sample, analysis, instrument, and chain-of-custody records as well as all related data tied back to the individual to provide accurate detailed reporting.

The reporting / ad hoc tools allow the customer to access data as needed to support their operations.

1.3 Overview

The survey data has been captured via a contractor built MS Access systems, word documents and excel spreadsheets and sql server solutions used at the Hanford Site. All of these systems lacked the ability to support a site-wide initiative of collecting, processing and reporting information from a single site-wide repository. The lack of controlling consistent input across the site into a site-wide repository, does not allow data mining in any consistent manor.

To address this problem, the SWIHD site-wide application was conceived. By using a single site-wide database to serve as a repository, the data collected and entered will be standardized thus allowing for more effect and meaningful reporting and data mining into the future.

1.4 Definitions

Terms and definitions used to describe all of the components used in this application are defined below.

1.4.1 Acronyms

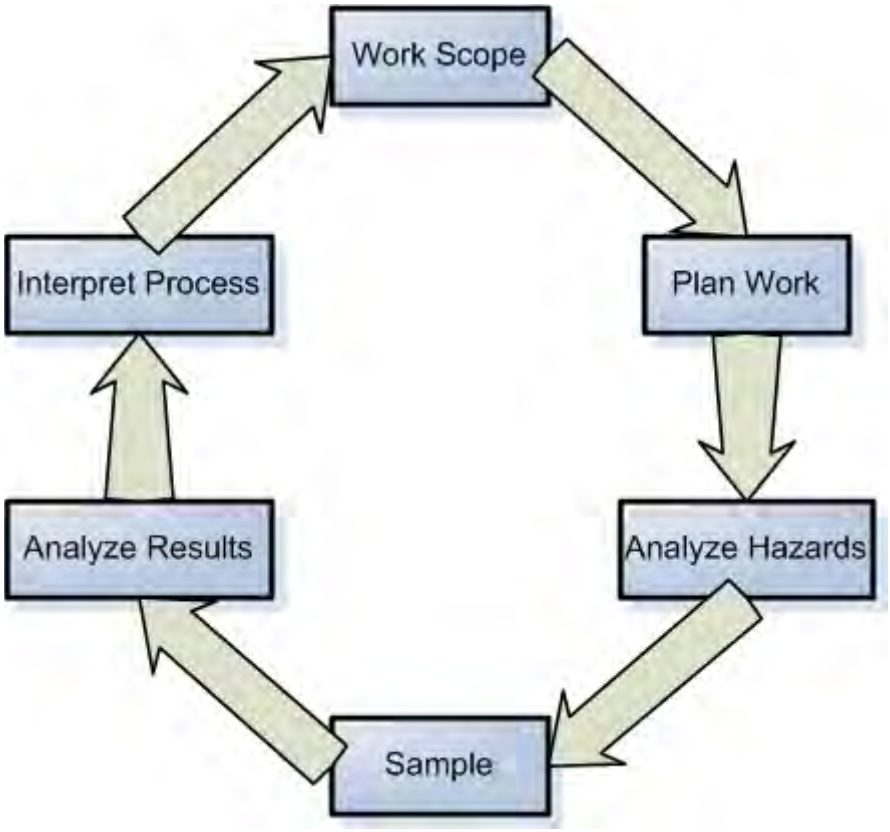
Acronym	Description
ACGIH	American Conference of Governmental Industrial Hygienists
AMH	Advanced Med Hanford
CFR	Code of Federal Regulations
COC	Chain of Custody
DOE	Department of Energy
DRI	Direct Reading Instrument
HID	Hanford Identification
HIH2	Hanford Industrial Hygiene 2
HLAN	Hanford Local Area Network
IDMS	Integrated Document Management System
IH	Industrial Hygiene/Industrial Hygienist
IHES	Industrial Hygiene Equipment Services
IHT	Industrial Hygiene Technician
LIMS	Laboratory Information Management System
NIOSH	National Institute for Occupational Safety and Health
OEL	Occupational Exposure Limit

Acronym	Description
OSHA	Occupational Safety and Health Administration
OUO	Official Use Only
PEL	Permissible exposure limit
PPE	Personal protective equipment
RTM	Requirements Traceability Matrix
SEG	Similarly Exposed Group
SQL	Standard Query Language
SWIHDDC	Site Wide Industrial Hygiene Database Development Committee
TFIH	Tank Farm Industrial Hygiene
TLV	Threshold limit value
TWA	Time Weighted Average
TWINS	Tank Waste Information Network System
WBGT	Wet Bulb Globe Temperature

1.4.2 Definitions

Term	Definition
Agent	Chemical, Biological, Physical, Ergonomics, Radiological
Bump Test	Field check – both pre-test and post-test are bump test to record instrument readings before and after use to insure that the piece of equipment remained accurate (legally defensible) while it was used in the field.
Calibration	Equipment calibration is performed at a location once each year per piece of equipment.
CAS#	(CAS#) Chemical Abstract Service (Registration) of an analyte/constituent
Electronic Approval	Sign off (electronically) in the system
IH Baseline Assessment	Scientific process of risk ranking and prioritizing health and safety risk to a specific job/task/step/function.
SWIHD	The application that provides data tracking and reporting of exposure information.
SWIHD Database	The central database for all sample data.
Media	The attachments to pumps like filters are considered media.
Project	A carefully planned scope of work to be performed at a specific location with an expected set of results.
Procedure	Definition of actions or operations which need to be followed. Stored procedures are computer programs which interact with the database when called to do so.
8- hr TWA	The fundamental concept of most occupational exposure limits. It represents the average concentration over an 8-hour workday within the context of a 40-hour work week.
Web Portal	Web Portals provide a way for enterprises to provide a consistent look and feel with access control and procedures for multiple applications and databases, which otherwise would have been different entities altogether.
Work Order	A document or package describing the scope of work to be preformed.

Exposure Assessment



This model represents the methodology used to produce an exposure assessement.

2.0 GENERAL DESCRIPTION

The SWIHD application is being developed to standardize the collection and reporting of sample information by organization, location, hazard, individual or similar exposure group. The system context diagram can be seen in Figure 1.

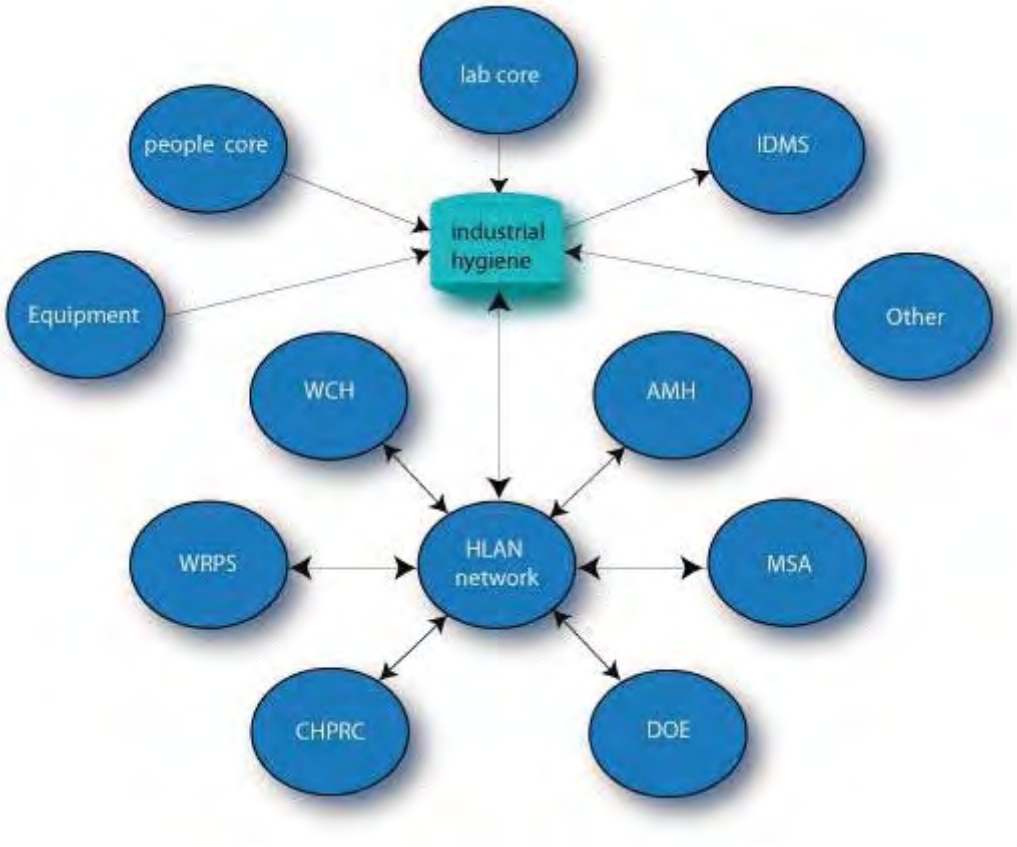


Figure 1 SWIHD Application Context Diagram

The SWIHD system will allow Industrial Hygienist and Industrial Hygienist Technicians to collect and record sample information from across the Site. The data will be made accessible for analysis and reporting. The system will integrate all systems together as well as accommodate the movement of information to and from various locations as necessary, such as LIMS, and AMH.

2.1 Organization Profile

Mission Support Alliance is the primary owner of the SWIHD application, with users all across the Hanford Site. The users include Mission Support Alliance, CH2M Hill Plateau Remediation Company, Washington Hanford Closure, Washington River Protection Solution, Advanced Technologies and Laboratories International and other subcontractor employees. The types of personnel using the SWIHD application are IH Professionals and IH Technicians. Lockheed Martin Services, Inc. manages the project integration, software development and maintenance.

2.2 Objectives

The objectives of this project are to maintain the current level of functionality provided by the Tank Farm Industrial Hygiene system (TFIH_SDD.doc in MKS) and expand functionality as needed to support the Site-Wide initiative. Current functionality includes the ability to collect, organize, store and report Industrial Hygiene information in a consistent approach. This functionality will be expanded to accommodate tracking and reporting of Similar Exposure Groups (SEGs) as well as allowing the contractors to customize their user interface to support their specific workflow requirements.

2.2.1 Customer

Mission Support Alliance is the application owner and all contractors on the Hanford Site providing Industrial Hygiene services are the customers of the SWIHD application. Mission Support Alliance hosts a Change Control Board that helps direct and control the changes and evaluate recommendations from other users.

2.2.2 Business

The overall business function of the SWIHD application is to assistance Industrial Hygienists in performing work to insure the safety and health of employees. In addition the application provides the process to identify and analyze hazards, collect samples, record results and provide statistical feedback through various data mining tools.

2.2.3 Project

The SWIHD application is intended to build upon lessons learned throughout the site by Industrial Hygienist and the systems they are currently using. The TFIH system, will serve as a baseline on which the site-wide system will be developed as it has been serving the Tank Farms for over the past 5 years. All current business rules which are underlying the functionality of the TFIH system will be integrated into the Site-Wide solution.

2.3 Product Perspective

The SWIHD application provides a graphical user interface via the web. The user interface will be customizable to the needs of each company providing Industrial Hygiene services on Site. As new technology is available, it is expected that the SWIHD application will be upgraded to provide continuous improvements in collecting, recording and reporting Industrial Hygiene information.

2.4 Product Functions

This section provides a summary of the functions that the SWIHD application performs.

2.4.1 SWIHD enhanced security and access controls

The SWIHD system will allow organizations to establish access controls for individuals within their organization. These controls or roles will be defined and managed from within each organization. The roles will control access to application functionality.

2.4.2 SWIHD User Interface

The SWIHD application user interface will be web based. This approach allows the SWIHD application to be flexible and accommodate the workflow requirements for each organization while maintaining a coherent Site-Wide database repository for the data collected.

2.4.3 SWIHD Database

The SWIHD database is the tool to be used to collect the information necessary to analyze hazards, process samples, retrieve and analyze data, provide feedback, and produce precise reporting.

2.5 Business Functions

The information collected and stored within the SWIHD application forms the basis for providing effective analytical assessments and meaningful reporting to support the needs of the Industrial Hygienist, Employees and Management.

2.6 User Characteristics

Users of the SWIHD application belong in one of several categories. These categories are Industrial Hygienist (IH), Industrial Hygienist Technicians (IHT), Equipment Lab Technicians, Clerks and Administration. Access to specific areas of the system is displayed in section 4.7. The interface is designed to be user friendly.

2.7 General Constraints

The SWIHD application will be deployed on the Hanford Site HLAN and use standard desktop computer products.

2.7.1 Verification

The primary constraint in conducting requirements verification involves stakeholder involvement and availability. All of the requirements set forth in this document have been approved and funded by the SWIHD application owner, MSA.

2.7.2 Validation

The requirements outlined in this specification shall be tested in accordance with the acceptance criteria documented in the SWIHD Requirements Traceability Matrix database (RTM).

2.7.3 Other(s)

The operation of SWIHD application is constrained by the availability of the HLAN network.

2.8 Design Constraints

The SWIHD application shall be designed in accordance with these constraints.

Availability of HLAN network
ScriptX licensing
Availability of Label Printers
Ability to export to Excel

2.8.1 Standards Compliance

The SWIHD application shall be in compliance with standard MSC-PRO-309, *Controlled Software Management*.

2.8.2 Resource Limitations

The SWIHD application currently requires a connection to the HLAN and a working Internet browser.

2.9 Assumptions and Dependencies

2.9.1 Assumptions

Assumptions made could affect the requirements, design, implementation, or testing. The following assumptions affect the design of the SWIHD application:

- Microsoft SQL Server is the chosen database software package. As with any software packages, it has some inherent limitations. If any limitations are encountered that affect this implementation, compromises will have to be made.
- It is assumed that all users using the SWIHD application will have the minimum computer hardware specified in Section 2.11.2.
- It is assumed that all data transfers to/from the SWIHD database to/from the Laboratory Computers will be through the HLAN. Any transfers from sources not on HLAN will need to be in accordance with standards established by the LMSI infrastructure group.

2.9.2 Dependencies

The SWIHD application shall depend on laboratories standardized formula for input of the sample results. The equipment lab will maintain an up-to-date check-in / check-out log which will be integrated into the SWIHD system.

2.10 Regulations, Procedures and Policies

The SWIHD application shall comply with the quality assurance program set forth in MSC-PRO-309, *Controlled Software Management* and in accordance with Lockheed Martin Services, Inc. implementing processes. Requirements stated in this document shall only be modified by the responsible stakeholders identified in the Project Stakeholder Matrix in DOE-0350, *Site Wide Industrial Hygiene Database Project Management Plan.*

2.11 External Interface Requirements

The SWIHD application shall interface with external systems which include Hanford PeopleCORE, LABCORE, WCH and Advance Med Hanford.

2.11.1 User Interfaces

The SWIHD application shall utilize an Internet Browser based user interface.

2.11.2 Hardware Interfaces

The SWIHD application shall utilize site approved specific hardware, desktop computers and the host file server on which the SWIHD database is located.

2.11.3 Software Interfaces

The SWIHD application shall utilize procedure calls and table driven interfaces.

2.11.4 Communication Interfaces

The SWIHD application shall communicate over the HLAN.

2.12 Internal Interfaces

The SWIHD application shall interface between the user interface and the SWIHD database.

3.0 SPECIFIC REQUIREMENTS

This section describes specific functional and performance requirements which must be satisfied by the SWIHD application.

3.1 Functional Requirements

The SWIHD application shall perform basic data management and reporting functions for Industrial Hygiene sample data site-wide. The data management functions include collection, modification, validation, transfer, storage and reporting. (RTM 3.1)

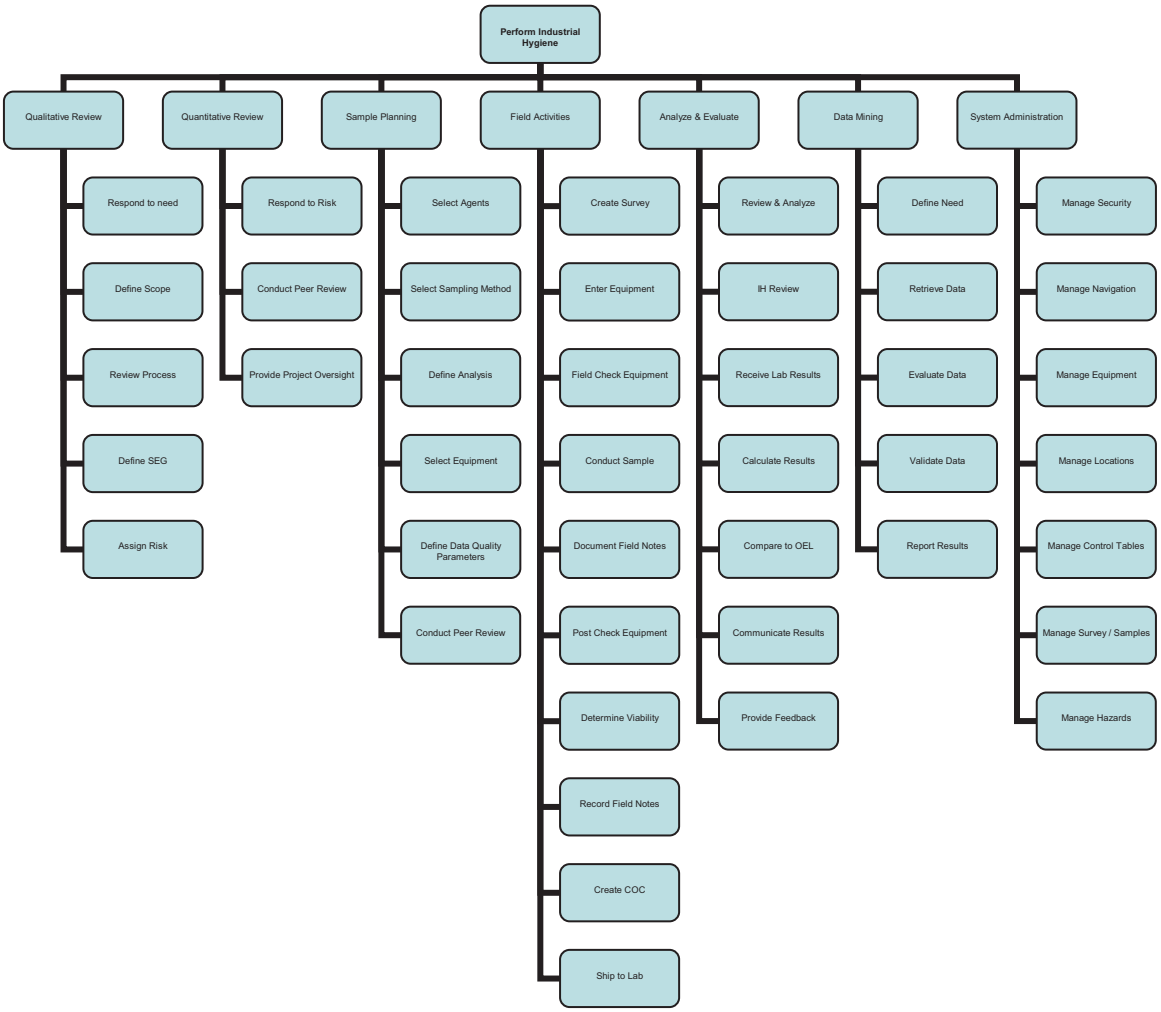


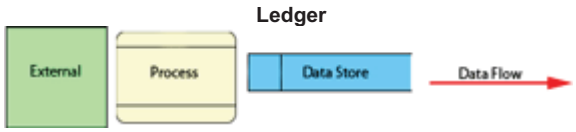
Diagram 3.1 Function Decomposition

3.2 Perform Industrial Hygiene Sampling

The process of planning, collecting, evaluating and reporting Industrial Hygiene Sample data is for the purpose of ensuring the health and safety of the employees on working on the Hanford site. This section

has several functions displayed within a dataflow diagram. The components of a dataflow diagram are:

External is a source from outside of the database.
Process is an activity taking place.
DataStore is a location where information is stored.
DataFlow displays the information going to or coming from the activity(s).



3.3 *Qualitative Review*

The process of determining what the Hazards and the risk are shown in Diagram 3.3.5 Assign Risk Data Flow below. (RTM function 3.3, requirement(s) 27)

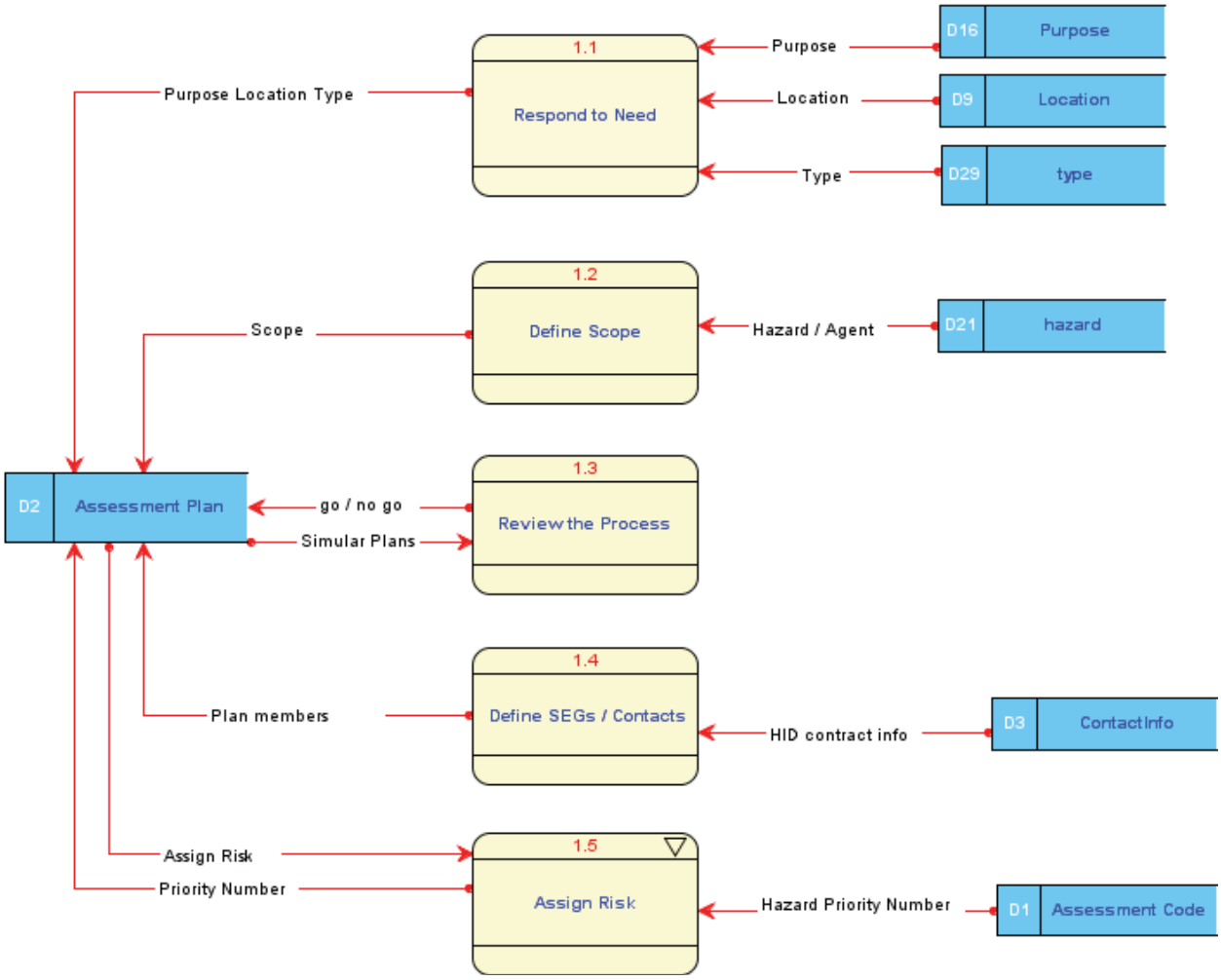


Diagram 3.3.0 Qualitative Review Data Flow

3.3.1 Respond to a defined need

This process responds to a potential hazardous situation. The need may be an employee concern, a job related activity or a directive. (RTM function 3.3.1 requirement(s) 107)

3.3.2 Determine Scope

The process of evaluating the situation and determining what the Hazards might be and what work is required to access the Hazards. (RTM function 3.3.2 requirement(s) 108)

3.3.3 Review the Process

This process looks at similar situations or experience to determine the best way to proceed. (RTM function 3.3.3 requirement(s) 109)

3.3.4 Define Similar Exposure Groups

The process of setting up similar exposure groups in areas relative to the expected Hazards. This section will also identify all contacts for this exposure assessment, including, job contacts, project Hi's and peer review IH's. (RTM function 3.3.4, requirement(s) 11,41,103,104)

3.3.5 Assign Risk

The process of establishing the risk involved and assigning an assessment code to the risk. The Assign Risk function has these sub-functions: Complete Hazard Worksheet, Assign Controls, and Assign Risk. (RTM function 3.3.5, requirement(s) 45,46,60,97)

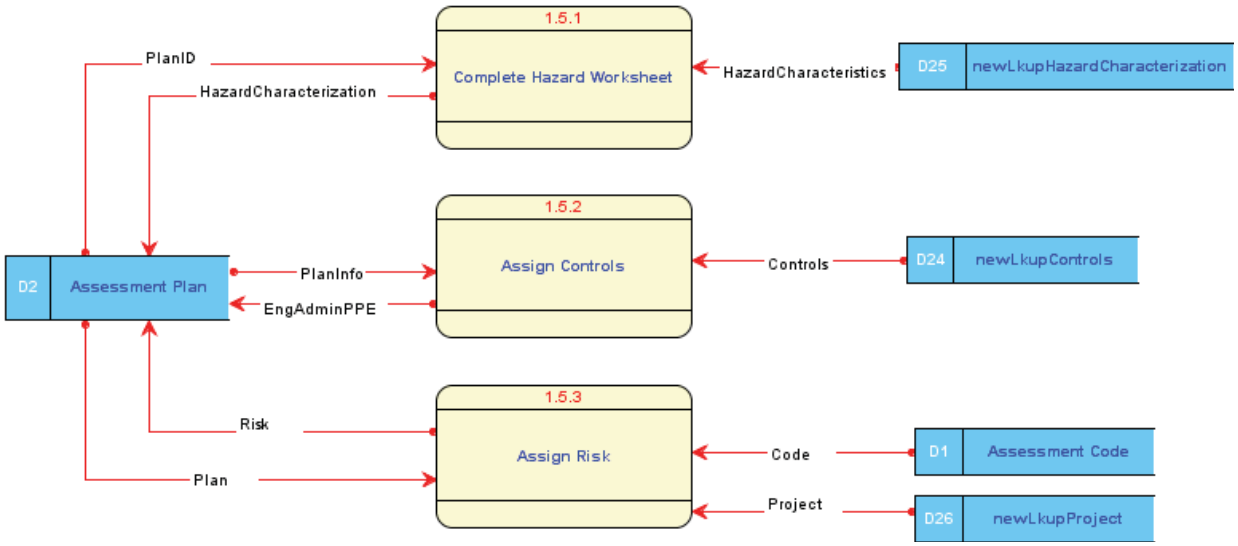


Diagram 3.3.5 Assign Risk Data Flow

3.4 *Quantitative Review*

This process determines if there are sufficient Hazards to be sampled.

3.4.1 Respond to Identified Risk

This process responds to a hazardous situation. (RTM function 3.4.1, requirement(s) 55)

3.4.2 Conduct Peer Review

The process of conducting a peer review of the exposure assessment is to validate and verify the recommendations from the exposure assessment. (RTM function 3.4.1, requirement(s) 3,103,104)

3.4.3 Load Sample Plan

The process of creating the sample plan from the information entered from the exposure assessment. This is a decision point where the IH decides whether to use the exposure assessment or not. This process has the ability to create sample plan and set initial status; or create a negative exposure assessment report. (RTM function 3.4.3, requirement(s) 102, 152)

3.4.4 Provide Project Oversight

This process provides oversight; managing projects; and monitoring project status. (RTM function 3.4.3, requirement(s) 38,100,151)

3.5 *Sample Planning*

The process of preparing to sample: (RTM function 3.5 requirement(s) 152)

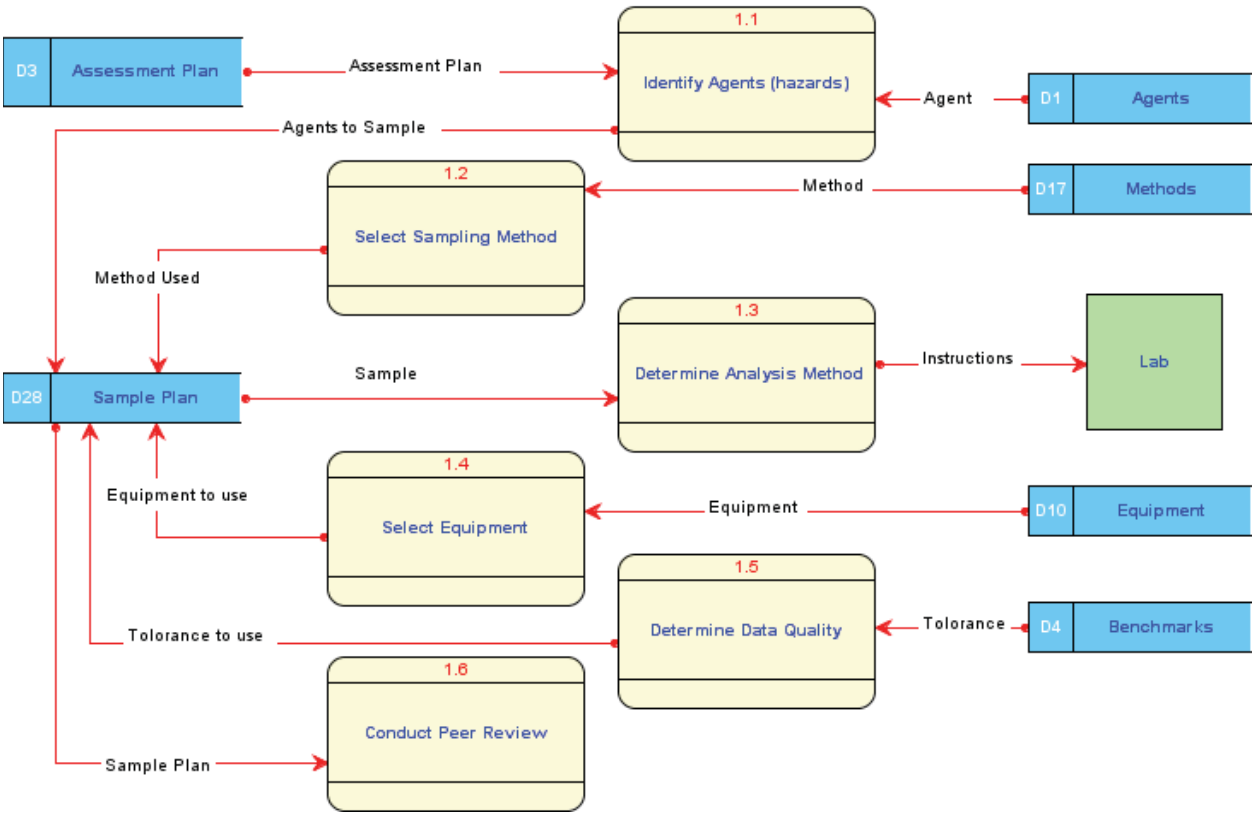


Diagram 3.5 Sample Planning Data Flow

3.5.1 Identify Agents (hazards)

The process determining which agents will be included in the sampling plan. The information necessary to make this determination will include Job or Project description, Work Order or Procedure, and Location. The system should track known agents at any location an offer those agents to the IH when the sampling plan is being created. (RTM function 3.5.1 requirement(s) 110)

3.5.2 Select Sampling Method

The process of selecting a standard method is to use, the media, flow rates, type of sample. (exp: NIOSH 7400 will tell the IH media, flow rate requirements, etc.) (RTM function 3.5.2 requirement(s) 111)

3.5.3 Determine Analysis

The process of informing the lab of the method used: Coordinating with the lab to ensure the lab's instruments can give an adequate result, based on the method. Sometimes we require a lower limit of quantification than some labs can achieve with certain accuracy %. (RTM function 3.5.3 requirement(s) 112)

3.5.4 Select Equipment

The process matches the equipment capabilities to the method & analysis used. (RTM function 3.5.4 requirement(s) 113)

3.5.5 Determine Data Quality

The process of determining tolerance levels of the results of the exposure assessment. (RTM function 3.5.5 requirement(s) 114)

3.5.6 Conduct Peer Review

The process of reviewing the quality of the sample, for human factor(s), gives a different perspective and technical concurrence, verify equipment. Trigger to change survey status mark ready for review. This will occur after the peer review change status. (RTM function 3.5.6, requirement(s) 55, 115)

3.6 *Conduct Field Activities*

The process of conducting work in the field: (RTM function 3.6 requirement(s) 151)

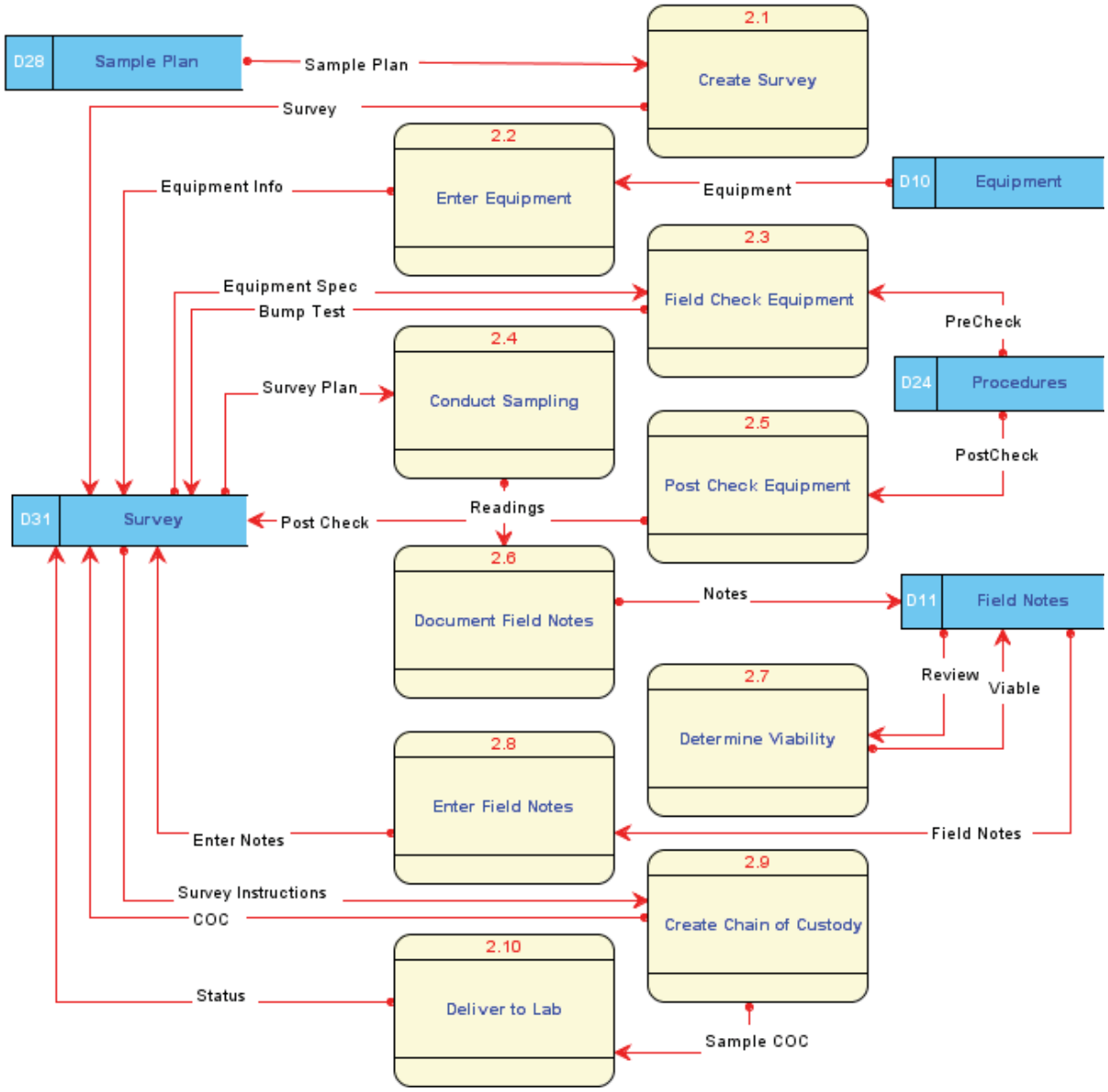


Diagram 3.6 Field Activities Data Flow

3.6.1 Create Survey

The process of creating the survey: This process captures the information from the Sample Plan and produces a survey. (RTM function 3.6.1, requirement(s) 101, 116, 153)

3.6.2 Gathering Equipment

The process of getting tools & paraphernalia from the equipment room or area: This may be individual components or a kit. (RTM function 3.6.2 requirement(s) 106, 118)

3.6.3 Field Checking Equipment

The process of ensuring the equipment is operational and in tolerance.

Based on Procedure/manufacturer's instructions; notate standard used, record reading, determine if within tolerance. Select standards to use:

- Select lot or device
- Record reading
- Access tolerance

(RTM function 3.6.3 requirement(s) 106, 119)

3.6.4 Conducting Sampling

The process of going into the field and collecting the sample based on survey instructions / directives in the sampling plan. Local knowledge (notate in field notes). (RTM function 3.6.4, requirement(s) 31, 120)

3.6.5 Documenting Field Notes

The process of recording field readings and occurrences: This is a manual process. All field readings and notes are collect to be entered into the system once the individual returns to the office.

3.6.6 Post Checking Equipment

The process of re-verifying equipment is operational and in tolerance & validate data collected.

Select standards to use:

- Select lot or device
- Record reading
- Access tolerance

(RTM function 3.6.6 requirement(s) 106, 121))

3.6.7 Determining Viability

The processes of ensuring you meet the criteria required for viability of sample. This is a manual process where the individual reviews the field notes before he or she enters the notes into the system.

3.6.8 Recording Field Notes

The process of transcribing information collected in the field and an entering it into the database. Add ability to store any attached documents, maps and etc. Add ability to auto load DRI reading. (RTM function 3.6.8, requirement(s) 4,14,25,31,32,55,65,66,106,117,122)

3.6.9 Creating COC/Lab Request

The process of producing a document with instructions to the lab with distinct sampling identifiers for each sample: (RTM function 3.6.9, requirement(s) 55,123)

3.6.10 Taking Sample to Lab

The process of taking the sample to the lab and collecting a signature of receipt from the lab: (RTM function 3.6.10 requirements(s) 55, 124)

3.7 *Analyze and Evaluate Results*

The process of accessing and communicating sample results:

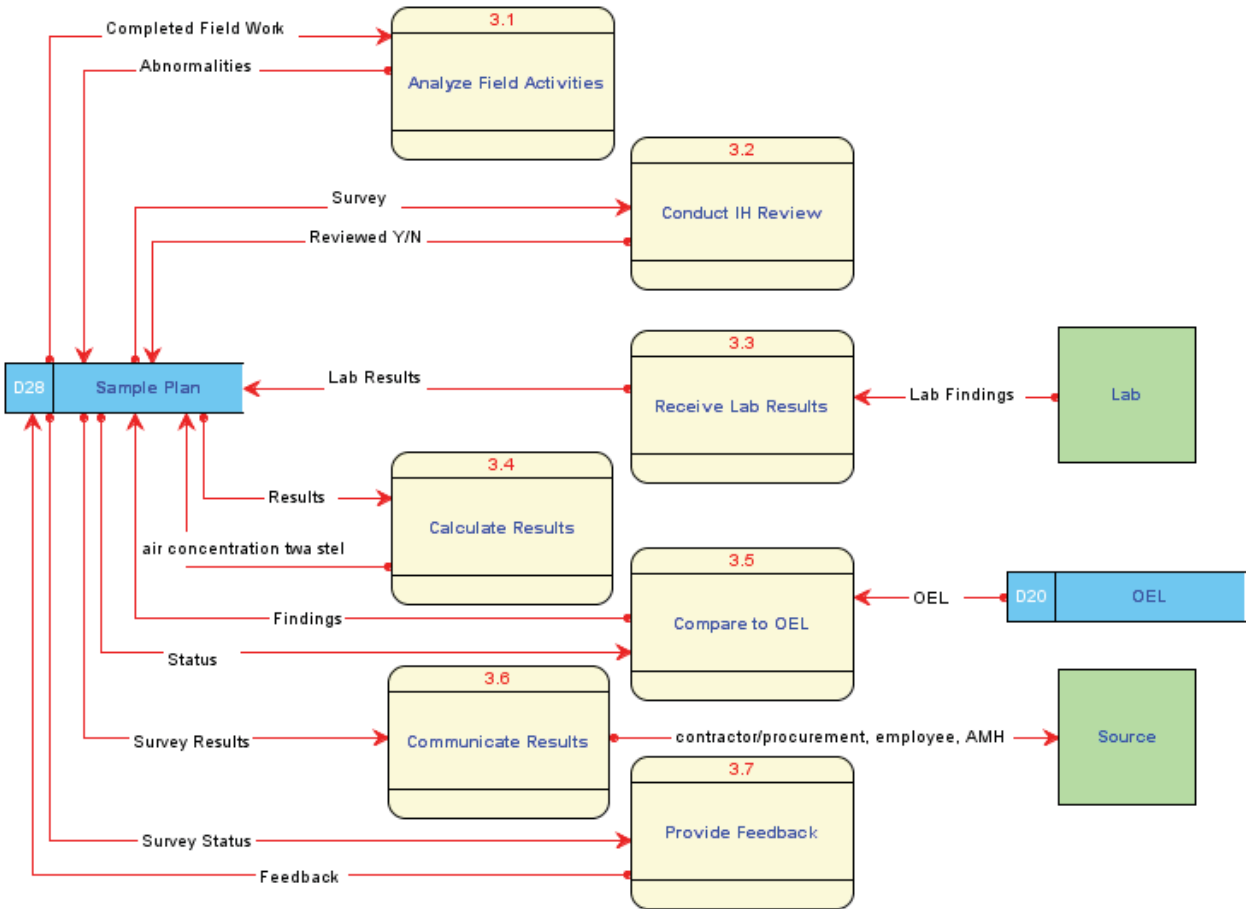


Diagram 3.7 Analyze and Evaluate Results Data Flow

3.7.1 Analyzing Field Activities

The processes of having the IH analyze the activities performed and making a determination if additional work is required. Did we fully get all the information we need? Did we meet data quality objectives? (RTM function 3.7.1 requirement(s) 125)

3.7.2 Conducting IH Reviews

The process of physically checking all of the information is completed.
Field log… inserting into system (push button on system) to notate that the analysis of the activities are completed. (RTM function 3.7.2 requirement(s) 126)

3.7.3 Receiving Results from Lab

The process of getting the results back from the lab; receiving interim and/or final results, and auto loading the LAB results as appropriate. (RTM function 3.7.3 requirement(s) 33,55,128)

3.7.4 Calculating Results

The process of pulling results into the database – calculate the raw mass into air concentration, time weighted average (TWA) 8/9/10 hrs, for personal exposure, excursion. (RTM function 3.7.4 requirement(s) 129)

3.7.5 Comparing to OEL

The process of comparing the calculated exposure to the Occupational Exposure Limits (OEL) (RTM function 3.7.5 requirement(s) 130)

3.7.6 Communicating Results

The process of the communicating the results to the workforce: Requirement is to notify individuals who were sampled; project status changes; lab results needing attention; and expectations to post results to those that need to know (via web, newsletters, etc.). Communicating results functionality may called by other modules as needed to insure all appropriate individuals needing timely information are notified. Auto load into IDMS all appropriate documentation to support the results. (RTM function 3.7.6, requirement(s) 10,12,26,55,85,131,151)

3.7.7 Providing Feedback (closure, path forward)

The process of providing feedback on the results to sample plan writers, and others that can change process to coinciding flow with need. (RTM function 3.7.7 requirement(s) 127)

3.8 *Data Mining*

The process of searching and reporting sample results: (RTM function 3.8, requirement(s) 1,95,96)

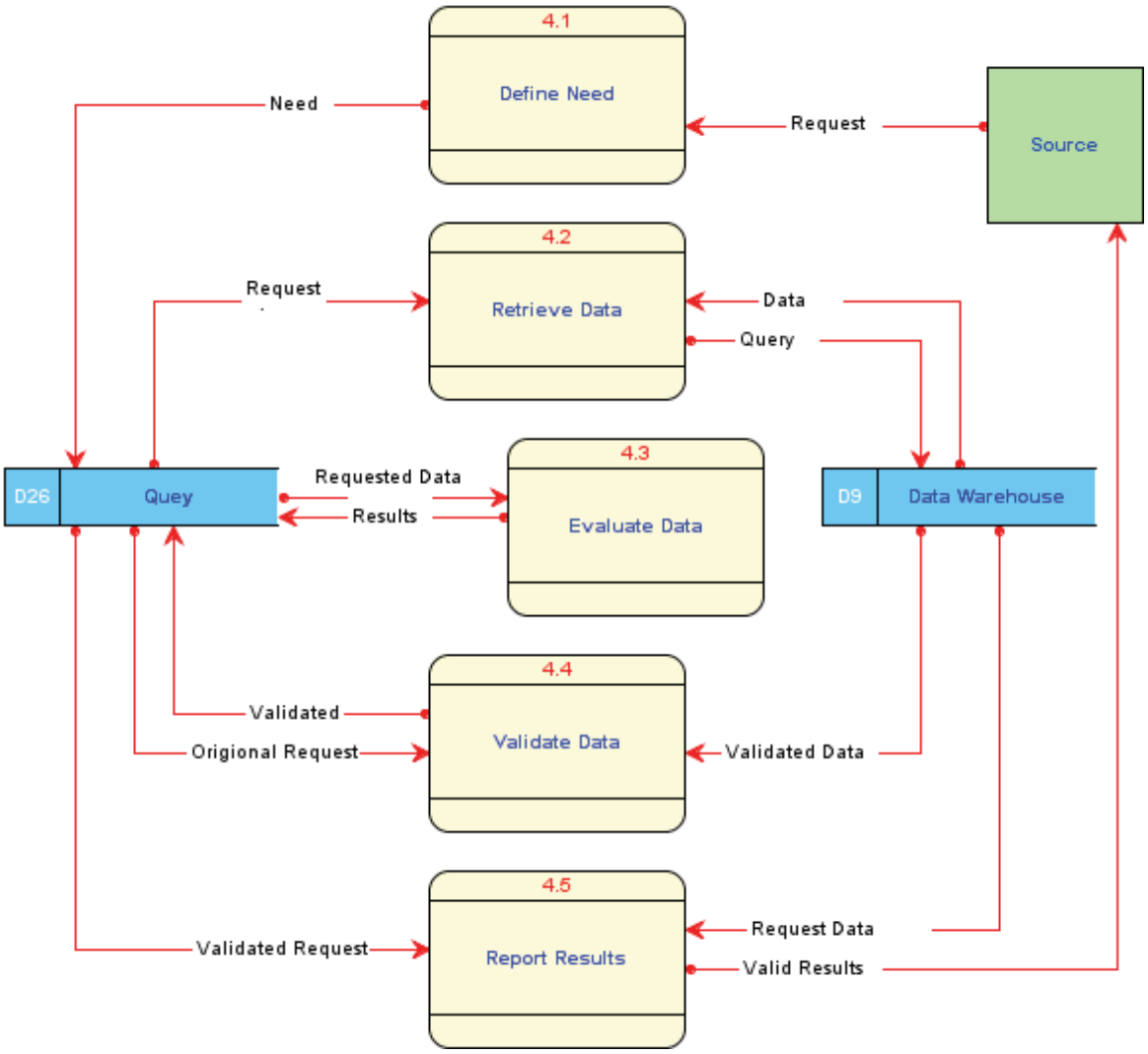


Diagram 3.8 Data Mining Data Flow

3.8.1 Defining Needed Information

The process of determining what you need where it is & how to get it. (RTM function 3.8.1 requirement(s) 139)

3.8.2 Retrieving Data

The process of searching the database for the data: (RTM function 3.8.2 requirement(s) 140)

3.8.3 Evaluating Results

The process of slicing & dicing the data: (RTM function 3.8.3 requirement(s) 141)

3.8.4 Validating Results

The process of ensuring data is meeting the needs established (official final data that will be published to the public). This is being validated by all the processes. (RTM function 3.8.4 requirement(s) 142)

3.8.5 Reporting Results

The process of preparing and producing requested results. (RTM function 3.8.5, requirement(s) 1,105,143)

3.9 System Administration

The process of managing system access and tables required to support the flexibility needed by the each organization. Note: The system administration functions will use wizards as appropriate to support the systems administrator in setting and managing the application.

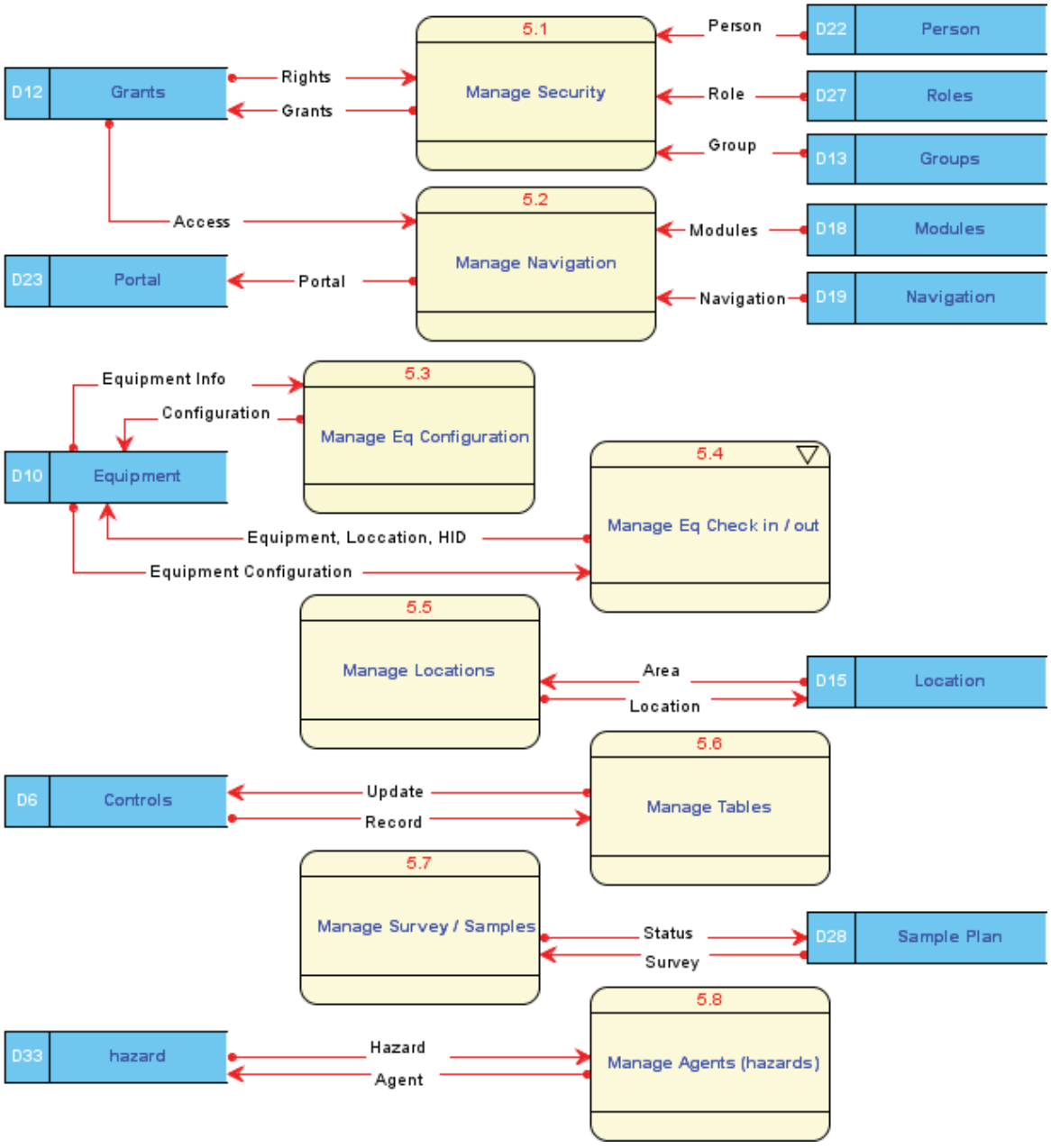


Diagram 3.9 System Administration Data Flow

3.9.1 Manage Security

The process of creating and managing access for users or groups of users, allowing each organization control access to each area of the application as determined by the systems administrator. (RTM function

3.9.1, requirement(s) 21,91,132)

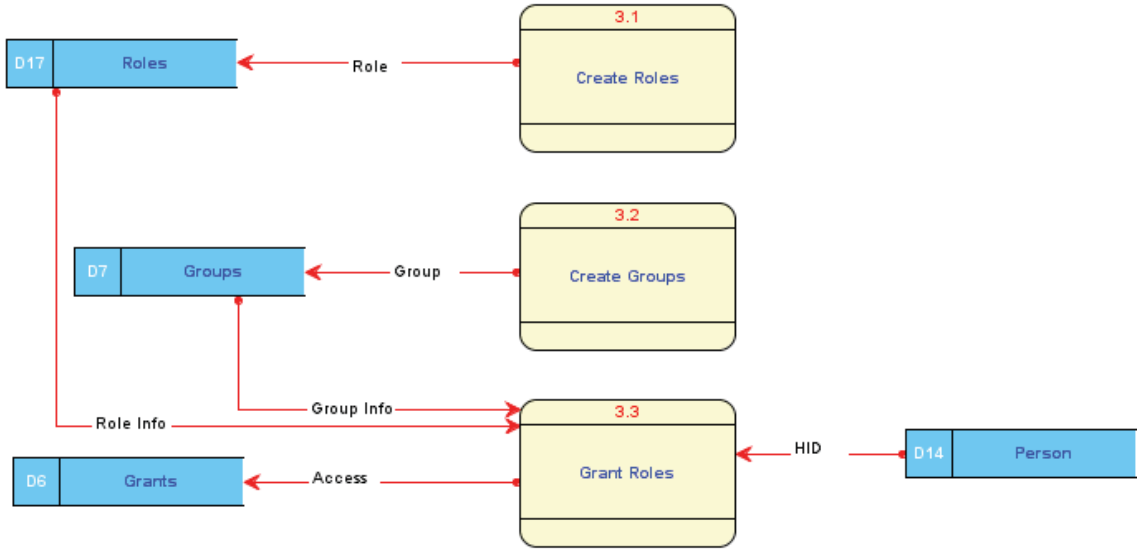


Diagram 3.9.1 Manage Security Data Flow

3.9.2 Configure Navigation

This process allows each Organization / Sub-Organization to setup individual portals for their specific groups or areas. In addition, each organization will have the ability to set up their navigation to be aligned to their workflow. (RTM function 3.9.2, requirement(s) 92,133)

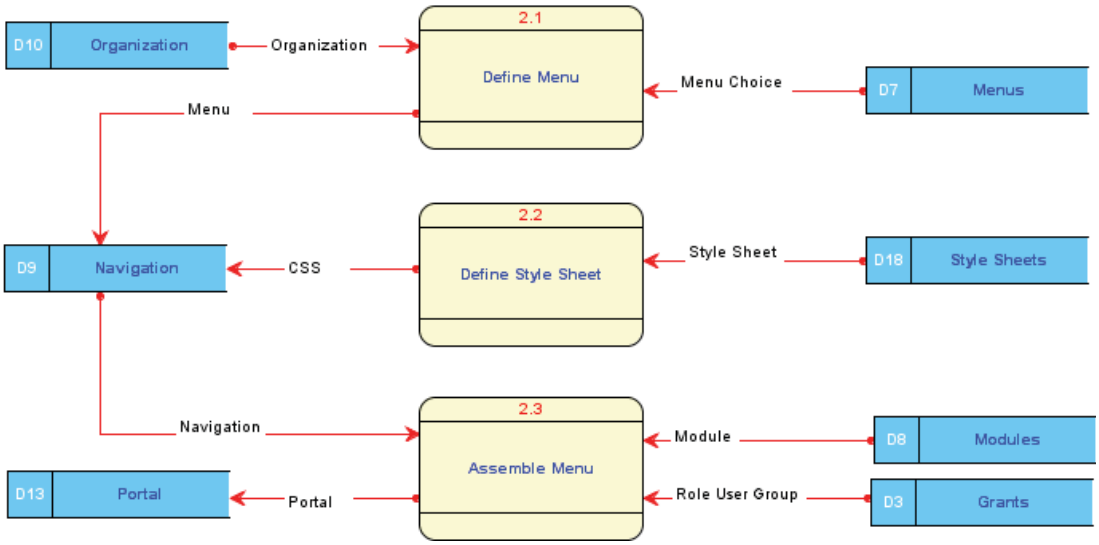


Diagram 3.9.2 Configure Navigation Data Flow

3.9.2.1 Manage Navigation Modules

The system will provide a flexible navigation system adaptable for each organization depending on the workflow requirements of the Organization. In order to achieve this flexibility, some modules will need to be linked to others modules. So when a module is called all of the support modules will be available as

needed. (RTM function 3.9.2.1, requirement(s) 92,133)

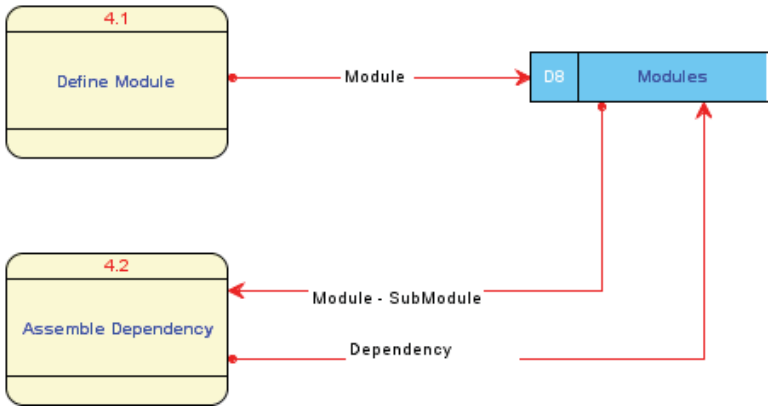


Diagram 3.9.2.1 Manage Navigation Modules Data Flow

3.9.3 Manage Equipment Inventory

The process of managing the equipment inventory to be used onsite: Add wizards to allow companies to assemble KIT's (link agent to equipment, equipment to sensor and etc) with equipment for specific sampling. (RTM function 3.9.3, requirement(s) 8,16,86,87,134)

3.9.4 Manage Equipment Check in / out

The process of managing and tracking the equipment used to support the Industrial Hygiene effort on site. This process captures the movement of equipment used in the field along with its calibration and maintenance history.

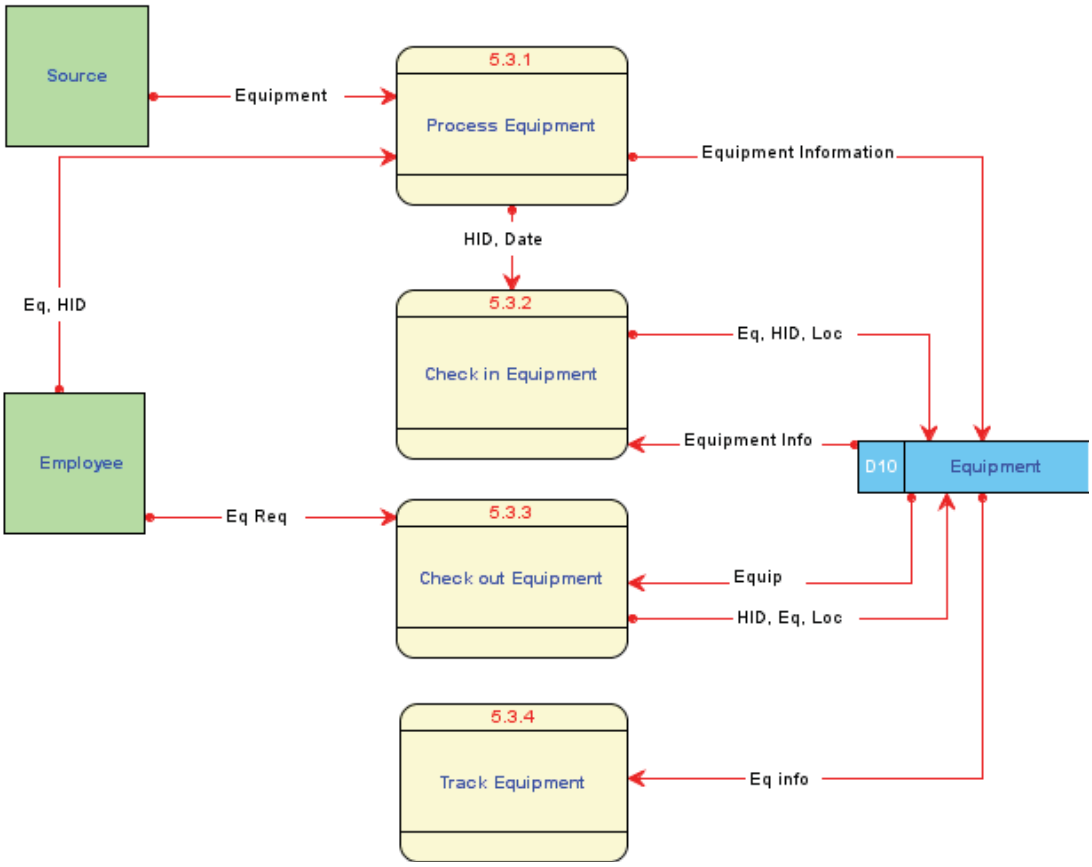


Diagram 3.9.2.1 Manage Equipment Modules Data Flow

3.9.4.1 Process Equipment

The process of receiving equipment from a source (vendor, employee, other) and entering it into inventory. This process may include returning equipment from the field as well. All equipment information is entered into the database. (RTM function 3.9.4.1, requirement(s) 144)

3.9.4.2 Check In Equipment

The process of checking equipment into the database: The status of the equipment is updated to reflect that the equipment has returned to the Lab. The position of the equipment in the Lab is tracked as well as the equipment being calibrated, repaired or placed on the shelf ready to be checked out? (RTM function 3.9.4.2, requirement(s) 144)

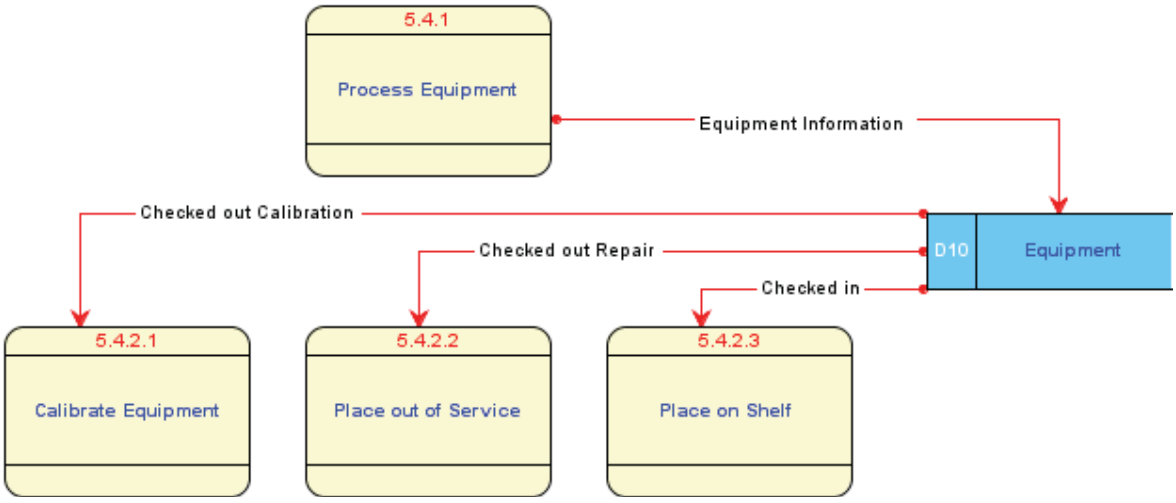


Diagram 3.9.2.1 Check In Equipment Modules Data Flow

3.9.4.3 Check out Equipment

The process of checking equipment out of the Equipment Lab to individuals: The information collected includes the individuals HID, location information. (RTM function 3.9.4.3, requirement(s) 145,147)

3.9.4.4 Track Equipment

The process of tracking equipment by person and location as stored in inventory. The system provides query and reporting facilities to support the needs of the customer. (RTM function 3.9.4.4, requirement(s) 146,148,149,150)

3.9.5 Manage Locations

The process of setting up and managing location information: (RTM function 3.9.5, requirement(s) 25,43,49,74,80,81,93,135)

3.9.6 Manage Tables

The process of setting up and managing all control tables and lookup tables: (RTM function 3.9.6, requirement(s) 6,9,35,42,47,136)

3.9.7 Manage Survey / Samples

The process of managing survey and sample records: (RTM function 3.9.7, requirement(s) 17,38,137)

3.9.8 Manage Agents (Hazards)

The process of setting up and managing hazard / agent information: Add wizards to create dependencies for agent and all related equipment. (exp: agent will have dependent equipment choices –> equipment will have dependent filters and etc…) (RTM function 3.9.8, requirement(s) 18,138)

3.10 *General Administration*

The process of ensuring the general operations of the system adheres to acceptable operational expectations.

3.10.1 Enable Audit Controls

The process of managing and maintaining audit trail of all SWIHD application transactions: (RTM function 3.10.1, requirement(s) 3,89)

3.10.2 Provide Backups

The SWIHD application shall maintain backup files of the database. The backup procedures will adhere to the standards for the site.

3.10.3 Oversee Performance

The SWIHD application is designed to accommodate an unlimited number of users. The system is also design to continue operating when errors are encountered.

3.10.4 Usability

The SWIHD application shall be easy to use. All user options will be displayed on the screen so users can step through the application. Wizards or similar tools will be made available as appropriate. (RTM function 3.10.4, requirement(s) 3,29,39,70,72,79)

3.10.5 Reliability

The SWIHD application shall be available around the clock. Contingency plans are available in case of system outage.

3.10.6 Supportability

The SWIHD application uses site standard hardware and software to ensure supportability. The exceptions are the Brother PT-9500pc Label printer and ScriptX licenses.

3.10.7 Operations

The SWIHD application has two main sources of data. These sources include sample data collected through the data entry and other sources streamlining the data collection process. (RTM function 3.10.7, requirement(s) 98)

4.0 MAINTENANCE

4.1 Corrective Maintenance

Defects within the SWIHD application shall be reported for correction through the system change request and documented in the Change Request and Problem Log. Problems can be reported by all users. Change requests and problem reports shall be reviewed by system administrators. The SWIHD change

control board will review and approve change request. (RTM function 4.1, requirement(s) 2,5,7,12,13, 15,22,26,28,36,37,40,48,50,52,54,56,57,58,62,63,69,71,72,74,77,78,79,80,81,82,,83,84,90,93)

4.2 Preventative Maintenance

The SWIHD application shall be maintained by preventative actions. The SWIHD change control board will review and approve change request. (RTM function 4.2, requirement(s) 6,12,17,26,35,47,48,85)

4.3 Backup and Recovery

The SWIHD application shall maintain system backup files for disaster recovery in accordance with site standards.

4.4 Conversion

The SWIHD application shall convert software and data on an as needed basis. The system will migrate data from the TFIH and the two clones of TFIH in use by CHPRC and WSA. The system will integrate WCH data into the system on scheduled bases.

4.5 Growth

The SWIHD application may require 200 MB/year of additional disk storage space to accommodate growth. Each sample requires significant disk storage space including supporting files, indices, and other database overhead files. The SWIHD database will import data from the TFIH system. The data imported from TFIH will include 30,000(+) surveys / samples and occupy approximately 850 MB of disk space. There are expected to be over 15,000 samples taken across the site each year. (RTM function 4.5)

4.6 Attributes

The SWIHD application currently has 1437 attributes to collect and store Industrial Hygiene information. The new attributes to be added the current TFIH system are identified in Section 5 will be added to the existing TFIH system accommodating enhancements to navigation, security, exposure assessment planning, wizard driven dependency relationships and increased functionality.

4.7 Software Application Security Requirements

The SWIHD application shall assign user privileges based on the information in Table 1. (RTM function 4.7 requirements 21, 91, 92)

Table 1. User Security Levels and Forms.

Function \ User Name	*Mgmt*	*IH*	*IHTech*	*Lab*	*Clerk*	*Admin*	*Site Admin*
Respond to Defined Need		✓					✓
Determine Scope		✓					✓
Review the Process		✓					✓
Define Similar Exposure Groups		✓					✓
Assign Risk		✓					✓
Respond to Identified Risk		✓					✓
Provide Project Oversight		✓					✓
Identify Agents (hazards)		✓					✓

Function \ User Name	*Mgmt*	*IH*	*IHTech*	*Lab*	*Clerk*	*Admin*	*Site Admin*
Select Sample Method		✓					✓
Determine Analysis		✓		✓			✓
Select Equipment		✓					✓
Determine Data Quality		✓		✓			✓
Conduct Peer Review		✓					✓
Conduct Field Activities		✓	✓				✓
Gather Equipment		✓	✓				✓
Field Check Equipment		✓	✓				✓
Conduct Sampling		✓	✓				✓
Document Field Notes		✓	✓				✓
Post Check Equipment		✓	✓				✓
Determine Viability		✓					✓
Record Field Notes		✓	✓				✓
Create COC/Lab Request		✓	✓				✓
Take Sample to Lab		✓	✓				✓
Analyze Field Activities		✓					✓
Conduct IH Reviews		✓					✓
Receive Results from Lab		✓			✓		✓
Calculate Results		✓					✓
Compare to OEL		✓					✓
Communicate Results		✓			✓		✓
Provide Feedback (closure, path forward)		✓					✓
Define Needed Information	✓	✓					✓
Retrieve Data	✓	✓					✓
Evaluate Results	✓	✓					✓
Validate Results	✓	✓					✓
Report Results	✓	✓			✓		✓
Manage Security						✓	✓
Manage Equipment						✓	✓
Manage Locations						✓	✓
Manager Tables						✓	✓
Manage Survey / Samples						✓	✓
Manage Hazards						✓	✓

5.0 OTHER REQUIREMENTS

5.1 Data

This section describes the data stored by the SWIHD application. (RTM function 5.1)

Data Name (revise survey id)	*Entity (revise survey id)*	*RTM*
NewSurveyID	Survey	RTM function 4.1, requirement(s) 40
	SrvInstrument	" "
	SrvPersonalInfo	" "

Data Name (revise survey id)	*Entity (revise survey id)*	*RTM*
	SrvSamplePassive	“ “
	SrvReadingEvents	“ “
	SrvPump	“ “
	SrvSurfaceDefintions	“ “
	SrvAgent	“ “
	SrvClientxWalk	“ “
	SrvAdminControls	“ “
	SrvEngineeringControls	“ “
	SrvFieldDev	“ “
	SrvMeteorology	“ “
	SrvStatusLog	“ “
	SrvUpdatedBy	“ “
	SrvWBGTInstrument	“ “
	SrvWBGTReadings	“ “
	RptSrvPersExp	“ “
	RptSrvPersExpXWalk	“ “
	RptSrvSamples	“ “
	SrvCalInstrument	“ “
	SrvDrispInstrument	“ “
	SrvDetectorTube	“ “
	SrvLabResultOSHARequired	“ “
	SrvLabResultOverOEL	“ “
	SrvOtherPPE	“ “
	SrvPeopleInst	“ “
	SrvPersExpXWalk	“ “
	SrvPersonalExposure	“ “

Data Name (revise survey id)	*Entity (revise survey id)*	*RTM*
	SrvPortSet	" "
	SrvRespEquipment	" "
	SrvRunTimeActive	" "
	SrvRunTimePassive	" "
	SrvSensor	" "
	SrvTempLabResultOSHARequired	" "
	SrvTmpLabResultOverOEL	" "
	TWINSFieldSample	" "
	Temp_AreaRAEData	" "
	Temp_CompErrorMessage	" "
	Temp_PPERAEData	" "
	SrvSurfaceSamples	" "
	SrvNoiseDosRunTime	" "
Data Name (revise location id)	***Entity (revise location id)***	***RTM***
NewLKUPLocationID NewGPSCoordinate	SrvSurfaceDefinition	RTM function 3.9.4, requirement(s) 43
	SrvSurfaceSamples	" "
	SrvRTALocation	" "
	SrvRTPlocation	" "
	RptSrvLocations	" "
	RptSrvSamples	" "
	SrvReadingEvents	" "
	SrvNoiseDosRunTime	" "
	SrvWBGTInstrument	" "
Data Name (add organization id)	***Entity (add organization id)***	***RTM***
OrganizationID	SrvSurvey	RTM function(s) 4.1

Data Name (revise survey id)	*Entity (revise survey id)*	*RTM*
	LkupSamplePlan	RTM function(s) 4.2, 3.9.5 requirement(s) 6
	LkupAgent	" "
	LkupCarcinogen	" "
	LkupLimitType	" "
	LkupManufacture	" "
	LkupInstrumentType	" "
	LkupModel	" "
	LkupSurveyType	" "
	LkupSurveyStatus	" "
	LkupReqAnalysis	" "
	LkupCalSource	" "
	LkupSensorType	" "
	LkupAirConcCalculation	" "
	LkupSamplingMedia	" "
	LkupInstrument	" "
	LkupFoia	" "
	LkupPmSampleType	" "
	LkupSampleType	" "
	LkupHPCompany	" "
	LkupShift	" "
	LkupExpShiftDefinition	" "
	LkupTask	" "
	LkupMiscList	" "
	LkupMethod	" "
	LkupSurveyID	" "
	LookUp	" "

Data Name (revise survey id)	*Entity (revise survey id)*	*RTM*
	LkupRequestor	" "
	LkupRespequipuse	" "
	LkupLabFlags	" "
	LkupCartridgeType	" "
	LkupRespiratorType	" "
	LkupBulkSpecLoc	" "
	LkupBulkLoc	" "
	LkupUserJobRole	" "
	LkupJobRole	" "
	CtrlSensorType	" "
	CtrlElectronicInstrument	" "
	AdmJobControl	" "
	AdmRunTypes	" "
	AdmJobs	" "
	AsbCheckList(marked for Delete)	" "
	AsbCheckListDetail(marked for Delete)	" "
	AbsOrderedMiscList(marked for Delete)	" "
Data Name (new items)	***Entity (new items)***	***RTM***
groupID	newGroup	RTM function(s) 3.9.1 requirement(s) 21,91,132
GroupName	newGroup	" "
OrganizationID	newGroup	" "
groupAccess	newGroupAccess	" "
RoleID	newGroupAccess	" "
RoleID	newRole	RTM function(s) 3.9.1 requirement(s) 21,91,132

Data Name (revise survey id)	*Entity (revise survey id)*	*RTM*
Role	newRole	" "
Rank	newRole	" "
userAccessID	newUserAccess	" "
RoleID	newUserAccess	" "
HID	newUserAccess	" "
userGroupID	newUserGroup	" "
groupID	newUserGroup	" "
HID	newUserGroup	" "
securityID	newUserGroupSecurity	" "
userAccessID	newUserGroupSecurity	" "
groupAccess	newUserGroupSecurity	" "
newLKUPAgentID	newLKUPAgent	RTM function(s) 3.3.5, 3.4.3 requirement(s) 46, 102
newLKUPAgent	newLKUPAgent	" "
AgentID	newLKUPAgent	" "
ExposureAssessmentID	newLKUPAgent	" "
LkupSamplePlanNumber	newLKUPAgent	" "
newLKUPControlItemID	newLKUPControlItem	RTM function(s) 3.3.5 requirement(s) 45,60
newLKUPControlItem	newLKUPControlItem	" "
newLKUPControlTypeID	newLKUPControlItem	" "
newLKUPControlTypeID	newLKUPControlType	" "
newLKUPControlType	newLKUPControlType	" "
OrganizationID	newLKUPControlType	" "
newLKUPControlTypeID1	newLKUPControlType	" "
newLKUPControlsID	newLKUPControls	" "

Data Name (revise survey id)	*Entity (revise survey id)*	*RTM*
newLKUPControlItemID	newLKUPControls	“ “
ExposureAssessmentID	newLKUPControls	“ “
newHazardID	newLKUPHazard	RTM function(s) 3.3.5 requirement(s) 46
Harzard	newLKUPHazard	“ “
OrganizationID	newLKUPHazard	“ “
newLKUPHazardCharacterization	newLKUPHazardCharacterization	“ “
HazardCharacterization	newLKUPHazardCharacterization	“ “
newLKUPHazardCharacterizationTypeID	newLKUPHazardCharacterization	“ “
newLKUPHazardCharacterizationAgent	newLKUPHazardCharacterization Agent	“ “
newLKUPHazardCharacterization	newLKUPHazardCharacterization Agent	“ “
newLKUPAgentID	newLKUPHazardCharacterization Agent	“ “
AgentPriority	newLKUPHazardCharacterization Agent	“ “
AgentComment	newLKUPHazardCharacterization Agent	“ “
AgentSample	newLKUPHazardCharacterization Agent	“ “
newLKUPHazardCharacterizationTypeID	newLKUPHazardCharacterization Type	“ “
newLKUPHazardCharacterizationType	newLKUPHazardCharacterization Type	“ “
OrganizationID	newLKUPHazardCharacterization Type	“ “
newPersonID	newLKUPPerson	RTM function(s) 3.3.4 requirement(s) 11, 41, 103,104
Name	newLKUPPerson	“ “
Organization	newLKUPPerson	“ “

Data Name (revise survey id)	*Entity (revise survey id)*	*RTM*
COCS	newLKUPPerson	" "
ContactPhone	newLKUPPerson	" "
CellPhone	newLKUPPerson	" "
newLKUPPersonTypeID	newLKUPPerson	" "
ExposureAssessmentID	newLKUPPerson	" "
HID	newLKUPPerson	" "
newLKUPPersonTypeID	newLkupPersonType	RTM function(s) 3.9.5 requirement(s) 6,35,136
newLKUPPersonType	newLkupPersonType	" "
OrganizationID	newLkupPersonType	" "
newLKUPProjectID	newLKUPProject	RTM function(s) 3.3.5, 3.9.5 requirement(s) 6, 42, 47,97
newLKUPProject	newLKUPProject	" "
OrganizationID	newLKUPProject	" "
newLKUPProjectID1	newLKUPProject	" "
newLKUPSEGID	newLKUPSEG	RTM function(s) 3.3.4 requirement(s) 11,41
newLKUPSEG	newLKUPSEG	" "
OrganizationID	newLKUPSEG	" "
newLKUPSamplePlanTypeID	newLKUPSamplePlanType	RTM function(s) 3.9.5, 4.1 requirement(s) 9
newLKUPSamplePlanType	newLKUPSamplePlanType	" "
OrganizationID	newLKUPSamplePlanType	" "
ExposureAssessmentID	newLkupExposureAssessment	RTM function(s) 3.3.1, 3.3.2, 3.3.3, 3.3.4,3.3.5, 3.4.2, 3.4.3, 3.6.1,3.7.6, 3.9.5, 4.2, 4.1, requirement(s) 11,27, 41,42,45,46,60,97,101, 102,103,104,107,108, 109
ExposureAssessmentNumber	newLkupExposureAssessment	" "

Data Name (revise survey id)	*Entity (revise survey id)*	*RTM*
Active	newLkupExposureAssessment	" "
Title	newLkupExposureAssessment	" "
AuthorHID	newLkupExposureAssessment	" "
AuthorName	newLkupExposureAssessment	" "
newSPRecommendation	newLkupExposureAssessment	" "
newSPRefDocument	newLkupExposureAssessment	" "
newLKUPLocationID	newLkupExposureAssessment	" "
newLKUPSamplePlanTypeID	newLkupExposureAssessment	" "
newLKUPProjectID	newLkupExposureAssessment	" "
newLKUPSEGID	newLkupExposureAssessment	" "
newHazardID	newLkupExposureAssessment	" "
MenuID	newLkupMenu	RTM function(s) 3.9.2 requirement(s) 133
MenuName	newLkupMenu	" "
MenuDescription	newLkupMenu	" "
OrganizationID	newLkupMenu	" "
ModuleID	newLkupModule	RTM function(s) 3.9.2.1 requirement(s) 133
ModuleName	newLkupModule	" "
ModuleID1	newLkupModule	" "
NavigationID	newNavigation	RTM function(s) 3.9.2.1, 3.9.2 requirement(s)133
NavigationName	newNavigation	" "
MenuID	newNavigation	" "
CSSID	newNavigation	" "
CSSID	newLkupCSS	RTM function(s) 3.9.2 requirement(s) 133
CSSName	newLkupCSS	" "

Data Name (revise survey id)	*Entity (revise survey id)*	*RTM*
OrganizationID	newLkupCSS	" "
PortalID	Portal	" "
PortalName	Portal	" "
PortalType	Portal	" "
newLKUPLocationID	newlkupLocation	RTM function(s) 3.9.4, 4.1 requirement(s) 25, 43,49,74,80,81,93,135
newLKUPLocation	newlkupLocation	" "
newLKUPLocationID1	newlkupLocation	" "
OrganizationID	newlkupLocation	" "
POCTypeID	newlkupPointOfContact	RTM function(s) 3.3,4, 4.1 requirement(s) 2,11, 41,103,104,155
POCName	newlkupPointOfContact	" "
POCType	newlkupPointOfContact	" "
lkupPOCTypeID	newlkupPointOfContact	" "
ExposureAssessmentID	newlkupPointOfContact	" "
HID	newlkupPointOfContact	" "
lkupPOCTypeID	newlkupPointOfContactType	" "
lkupPOCType	newlkupPointOfContactType	" "
OrganizationID	newlkupPointOfContactType	" "
LotID	newLkupLot	RTM function(s) 3.9,4.1, 3.9.4.2, 3.9.4.4 requirement(s) 144,146,148,149,150, 156
LotNumber	newLkupLot	" "
newLkupLocationID	newLkupLot	" "
NoticeOfDiscrepancyID	newNoticeOfDiscrepancy	RTM function(s) 3.9.4.4 requirement(s) 146,148, 158,159
NoticeDate	newNoticeOfDiscrepancy	" "

Data Name (revise survey id)	*Entity (revise survey id)*	*RTM*
Disposition	newNoticeOfDiscrepancy	" "
Reject	newNoticeOfDiscrepancy	" "
Name	newNoticeOfDiscrepancy	" "
EvaluationReceived	newNoticeOfDiscrepancy	" "
Comment	newNoticeOfDiscrepancy	" "
InstID	newNoticeOfDiscrepancy	" "
newCyl#	newLkupCalSourceNum	RTM function(s) 3.9.4.4 requirement(s) 149,159
newConcPPM	newLkupCalSourceNum	" "
LotID	newLkupCalSourceNum	" "
CalHistoryID	newCalHistory	RTM function(s) 3.9.4.4 requirement(s) 146,149
LastDate	newCalHistory	" "
DueDate	newCalHistory	" "
Frequency	newCalHistory	" "
InstID	newCalHistory	" "
CheckInCheckOutID	newCheckInCheckOut	RTM function(s) 3.9,4.1, 3.9.4.2, 3.9.4.3 requirement(s) 144,146,147,150, 156, 157,159
CheckInCheckOutDate	newCheckInCheckOut	" "
HID	newCheckInCheckOut	" "
CheckOut	newCheckInCheckOut	" "
InstID	newCheckInCheckOut	" "
newLkupLocationID	newCheckInCheckOut	" "

5.2 Site Adaptation

Access to the SWIHD application shall be through the HLAN and Software Distribution.

5.3 Options

The TFIH application has been operational since 2003. This proposal is intended to enhance that system to make it a flexible site-wide solution for all Industrial Hygiene Contracts of the Hanford Site.)

5.4 Scheduling

The SWIHD application shall be available around the clock.

5.5 Audit

The SWIHD application shall maintain an audit trail. (RTM function 5.5 requirement 10,89)

5.6 Priorities

The SWIHD application shall interface internally and externally through the HLAN. (RTM function 5.6 requirements 10,16,32,33,48,98)

5.7 Documentation

This SWIHD Software Requirements Specification shall be updated in accordance with DOE- 0350, *Industrial Hygiene Project Management Plan*. (RTM function 5.7 requirement 160)

5.8 Training

Training requirements for the SWIHD application users shall be addressed in DOE- 0350, *Industrial Hygiene Project Management Plan*.

5.9 Security and Privacy

The SWIHD application shall be secured through access to the application. (See section 4.7. RTM 5.9 requirement(s) 90)

6.0 REFERENCES

10-CFR-820, “Procedural Rules for DOE Nuclear Activities,” *Code of Federal Regulations,* as amended.

10-CFR-830.120, “Nuclear Safety Management Quality Assurance Requirements,“ *Code of Federal Regulations,* as amended.

MSC-PRO-309, *Controlled Software Management.*

MSC-PRO-311, *Functional Security Requirements/Application Development.*

MSC-PRO-596, *Certifying Sensitive or Essential Computer Applications.*

MSC-PRO-2778, *IRM Application Software System Life Cycle Standards.*

APPENDIX A - IDMS

IDMS Integration

Purpose

This document's purpose is to define the specifications for utilization of the IDMS Generic Interface. The specifications can be used to assist in the development of new interfaces to IDMS.

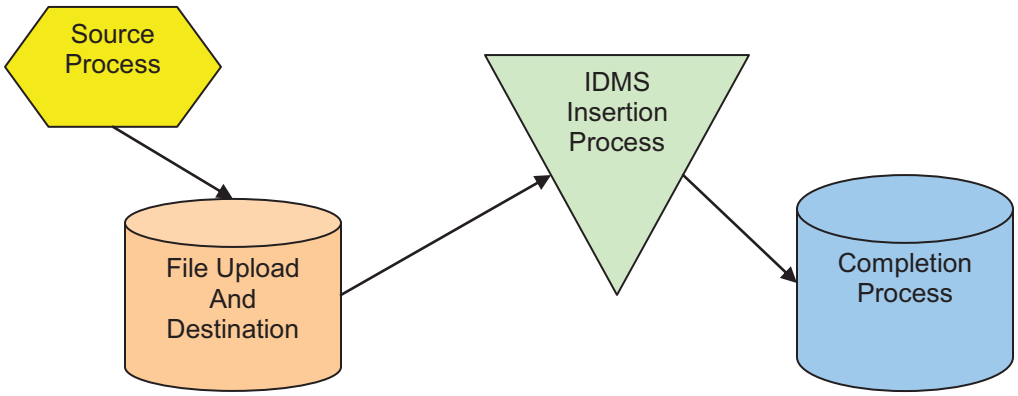
Scope

This document only covers the generic implementation of the IDMS Generic Interface. Some implementations will require some modification to the logic of the interface to accommodate the customer's needs; these needs will not be covered.

General Process Overview

From a general point of view the Interface has 4 processes; these include the source process, file upload area, insertion into IDMS, and completion notification area.
The source process is the "customer" or "consumer" of the IDMS Generic Interface. It is written/managed by the customer and must adhere to the specifications of the IDMS Generic Interface.
The file upload is simply the upload of the file destined for IDMS into a predetermined network file share by the source process. The file is accompanied by two additional files, covered in a later section of the document.
The insertion into IDMS process takes the file from the predetermined network share and using the OpenText provided API adds the item to the proper location in IDMS with the proper Meta data attached.
The completion notification process writes a success or failure message to a "completed" share area for the source process to fetch and handle as it is designed to.

Graphically it looks like:



Source Process Detail

The source process creates the documents destined for IDMS storage, this process is created and owned by the customer not IDMS. This process must have the ability to copy the three files needed to the IDMS Interface's drop zone. The source process must copy the files in the proper order. The three files must have the same file names as described below.

The required files, in order, include:

The document:
The document can be of any type that IDMS can accept, PDF, HTML file, word documents, text document, images etc.
The XML descriptor:
The XML descriptor contains the meta data to be passed to IDMS. The data elements are determined by the IDMS category to be applied to the document. The file structure is as follows:

```
<?xml version="1.0" encoding="UTF-8"?>
<GateKeeper VER="2.0">
        <requiredfields>
                <Interface><![CDATA[Interface Name Here]]></Interface>
                <WorkSpace><![CDATA[Destination Object]]></WorkSpace>
                <DocumentFileName><![CDATA[file.ext]]></DocumentFileName>
        </requiredfields>
        <categoryfields>
                <CategoryField><![CDATA[Data]]></CategoryField >
        </categoryfields>
        <additionalfields/>
</GateKeeper>
```

Key elements:

GateKeeper – this is the XML root object its only attribute is the VER="", the value used is determined by the IDMS I-Team and provided to the customer before development of the source process.
Interface – this value is the name that the source process is known by, this value must be provided to the IDMS I-Team before the Interface can accept any documents from the source
Requiredfields – these fields are used to identify the destination root object, the file name of the document, and any sub objects that must be added to IDMS to contain the document, it also contains the identifier given to the source process by the IDMS I-Team
Categoryfields – these are determined by the IDMS category assigned to the document objects being added by the Interface. An example is the Basic Category.
CDATA – this convention (a XML Standard) is required in all elements delivering XML Text data.

The trigger file:
This file is what the IDMS Interface looks for to begin processing a document. It is simply an empty file, with a .trg extension. This file must be the last file written by the source process to ensure that the IDMS Insertion Process does not attempt to open and read the other files.

File names:
All three files must have the same name. An example would be:
document file name CLO-WO-05-000277.pdf
xml descriptor file name CLO-WO-05-000277.xml
trigger file name CLO-WO-05-000277.trg

IDMS Destination location

A folder object(s), inside the IDMS workspace designated, can be created to store the uploaded documents and to assist the organization of the uploaded documents. These are described in the XML descriptor file's <requiredfields> elements. These elements describing the location must be added to the upload process's logic and can be decided by the Customer before the logic is updated. An example would be to segregate documents by year (i.e. 2006) then month (i.e. 09 or September). Other schemes to segregate documents are also possible.

File Upload

The file upload portion of the interface is simply a network file share. The source process writes their files to this share and the IDMS insertion process reads from this share. The current production location of this share can be obtained from the IDMS I-Team.

IDMS Insertion Process

The IDMS insertion process consists of 2 parts, file system logic for reading and managing the files in the file upload area and completion area, and the logic controlling the LLAPI calls inserting the document into IDMS.

The file system logic remains the same for all interfaces, which means that all interfaces must adhere to the 3 file drops and the order those files are created, document, xml, and lastly trigger. This helps keep the interface as open as possible.

The LLAPI logic can be modified to accommodate some changes or destination differences between the interfaces. A map is created for the LLAPI logic and is used to convert between the XML descriptor containing the meta data for the document and the IDMS Category being applied to the document once it is inserted into IDMS. The maps are unique to each interface. Any sub folder objects used to segregate documents are handled in the LLAPI logic.

Completion Process

The completion process places an XML file in the Complete network share that contains any messages pertaining to the document insertion process. This file may contain success messages and a URL to the new document in IDMS, or an error message containing the reason for insertion failure. An interface is required to collect and remove their messages from this share every time the interface is accessed.

Example success file:
File name: CH2M-PER-2006-0195_file_1_success.xml
XML:

```
<?xml version="1.0" encoding="UTF-8"?>
<GateKeeper>
        <MessageType><![CDATA[Success Message]]></MessageType>
        <Message><![CDATA[Entry - CH2M-PER-2006-0195_file1.html - was successfully added to
IDMS]]></Message>
        <DocumentLink><![CDATA[http://idmsprodcf01.rl.gov/ll95sp1a/livelink.exe?func=ll&objId=10253&
objAction=browse&sort=name&viewType=1]]></DocumentLink>
        <DocumentNumber><![CDATA[CH2M-PER-2006-0195]]></DocumentNumber>
</GateKeeper>
```

Example failure file:
File name: CH2M-PER-2006-0195_file_2.xml
XML:

```
<?xml version="1.0" encoding="UTF-8"?>
<GateKeeper>
        <MessageType><![CDATA[Error Message]]></MessageType>
        <Message><![CDATA[LAPI Interface failure, check your XML Descriptitor Values. Error Message
from IDMS: Value not one of the Values ]]></Message>
        <DocumentNumber><![CDATA[CH2M-PER-2006-0195]]></DocumentNumber>
</GateKeeper>
```

Error and Problem handling

Most possible errors are handled by the IDMS Interface; these are written to the complete area so that the source process may handle the errors appropriately. There are some errors not handled automatically by the IDMS interface. These include category changes in IDMS and changes to the destination root object. These changes should not be unknown and any problems will be addressed on a case by case basis.

APPENDIX B - WCH

WCH Integration

Purpose

This document's purpose is to define the specifications for the integration of the WCH dataset into the SWIHD database.

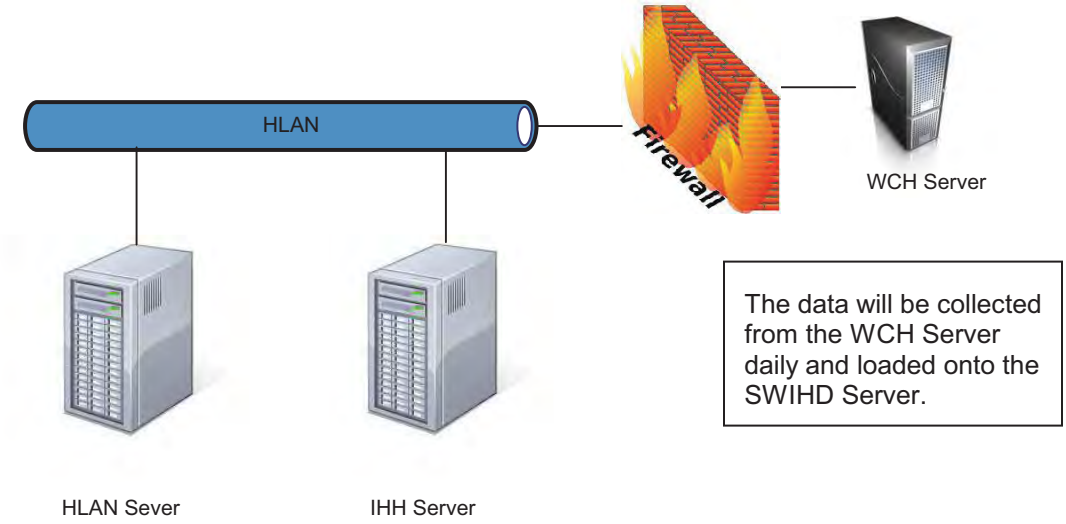
Scope

This document only covers the high level integration outline to move the data from the WCH database into the SWIHD database. The actual implementation process will be defined in detail during the SWIHD design and development project.

General Process Overview

The WCH system will continue to be used until their contract is complete. The data collected daily by WCH IH staff will be moved nightly into the SWIHD site-wide database.

Graphically it looks like:



File Upload

Nightly all of the data entered that day will be transmitted to the HLAN server. The file(s) will include all records for that day based on survey number and survey date.

Integration Process

The data will be loaded in temporary tables on the HLAN server. There the data will be processed and inserted into the appropriate files in the SWIHD database. The values derived from lookup tables will need to be cross-walked or cross-referenced to adhere to site-wide standards.

Error and Problem handling

Daily transaction log file will be produced. In the event of a failure during the integration process, an alert will be issued and the appropriate individuals notified to address the problem.

APPENDIX C - WEATHER STATIONS

Weather Integration

Purpose

This document's purpose is to define the specifications for integrating data from the Meteorological and Climatological Services Hanford Weather Station system.

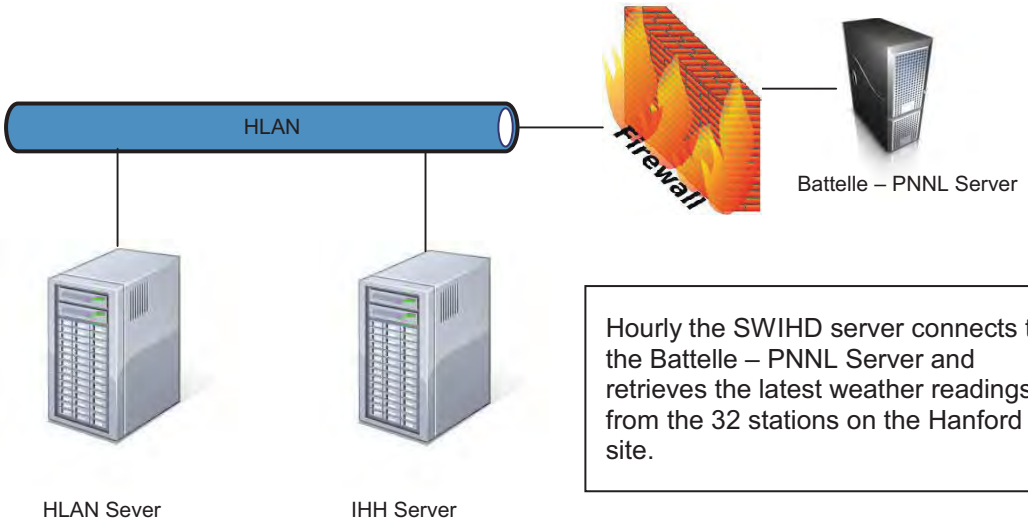
Scope

This document identifies a source of Hanford Meteorological Monitoring data. The intent is to capture this data and store a copy of the information with the permanent record.

General Process Overview

The Meteorological and Climatological records are being produced every 15 minutes for the 32 sites located on the Hanford site. The SWIHD system will pull a copy of these records into the database where they will be placed into storage. When a survey is written to the permanent record all relevant weather readings within the area of the sample will be included in the permanent record.

Graphically it looks like:



Process

A routine will be launched every hour to connect to the Battelle weather site. The weather information will be scrapped off the web site and loaded into a temp table where it will automatically evaluate and then inserted into a weather log file indefinitely.

Error and Problem handling

In the event of a failure during the evaluation process, a flag will trigger an email notification to the Site-Wide Administrator for immediate action.

Example Dataset

Below are the instructions to evaluate the data retrieved from the Battelle weather web site.

http://hms.pnl.gov/download/download.htm
http://hms.pnl.gov/download/format.txt - describes the format of the files

```
HMS - Hanford Meteorological Monitoring Network

raw 15-minute data

   Date      Time
07/20/2009  5:45 PST
sta #   Wdir    Wspd    Gust   Ave T   Max T   Min T   precip  press
  1.0  30.056   2.651   4.285  64.485  65.102  64.136   0.000-99.0000
  2.0 327.028  15.392  21.107  72.702  72.932  72.351   0.000-99.0000
  3.0 326.466   7.020   9.121  70.041  70.897  67.280   0.000-99.0000
  4.0 288.253   6.652  10.173  74.996  75.378  74.406   0.000-99.0000

Wdir = degress from which the wind is blowing
Wspd = miles per hour, gust is the max 1 sec wind during that period

Temperatures are degrees F
Precipitation is inches
Pressure is inches Hg

Below is one 15-minute report.  There are no blank lines:

07/20/2009  5:45 PST
  1.0  30.056   2.651   4.285  64.485  65.102  64.136   0.000-99.0000
  2.0 327.028  15.392  21.107  72.702  72.932  72.351   0.000-99.0000
  3.0 326.466   7.020   9.121  70.041  70.897  67.280   0.000-99.0000
  4.0 288.253   6.652  10.173  74.996  75.378  74.406   0.000-99.0000
  5.0 252.520   1.332   3.023  64.001  66.126  61.865 -99.000-99.0000
  6.0 307.000   3.342   5.547  68.180  69.350  66.990   0.000 29.3400  45.1
  7.0 211.309   3.458   7.019  70.067  71.128  69.256   0.000-99.0000
  8.0   6.359   5.039   9.752  67.469  68.298  66.947   0.000 29.5315
  9.0  74.350   2.504   3.444  65.690  66.310  64.830   0.000 29.4586  50.3
 10.0 330.209   8.414  12.065  72.688  73.101  72.113   0.000 30.0192
 11.0 339.600   2.578   3.444  61.980  63.170  60.800   0.000 29.6368  60.9
 12.0 103.138   4.464   6.598  64.433  64.794  64.154   0.000-99.0000
 13.0 181.700   2.759   5.126  63.980  64.720  62.910   0.000 29.5586  47.6
 14.0  36.188   3.809   5.757  64.352  65.196  63.718   0.000-99.0000
 15.0  13.627   5.439   8.280  63.734  64.153  63.303 -99.000-99.0000
 16.0  15.553   7.303   9.332  69.695  70.017  69.521 -99.000-99.0000
 17.0 324.170   1.040   1.762  59.817  61.329  59.077   0.000-99.0000
 18.0  35.310   2.730   3.864  64.699  65.231  64.089   0.000 29.6177
 19.0 351.801   3.128   6.576  72.617  73.437  71.812 -99.000 29.3525
 20.0   8.815  23.486  30.720  63.899  64.378  63.016   0.000-99.0000  36.4
 21.0 321.080   5.251   8.070  68.548  69.307  67.815   0.000 29.3010  42.4
 22.0 354.565   3.724   7.453  61.671  62.869  61.151   0.000-99.0000
 23.0 165.031   3.765   6.388  63.764  65.195  62.512 -99.000-99.0000
```

24.0	179.816	2.288	4.075	61.817	62.218	61.510	0.000-99.0000	
25.0	272.895	7.832	11.014	69.951	70.303	69.352	-99.000-99.0000	60.6
26.0	252.887	6.937	10.383	63.791	64.526	62.766	0.000-99.0000	71.4
27.0	358.109	2.624	4.075	65.176	65.723	64.936	0.000-99.0000	
28.0	170.938	1.368	3.023	66.029	67.382	64.149	0.000 29.6743	
29.0	298.592	4.103	6.138	66.185	66.415	65.921	0.000 29.5888	
30.0	175.900	5.661	10.170	93.200	94.400	92.200	-99.000-99.0000	
31.0	318.776	3.720	6.138	72.463	73.120	71.663	-99.000-99.0000	
32.0	294.500	2.526	4.706	69.730	70.570	69.000	0.000-99.0000	

APPENDIX D - IHES

Industrial Hygiene Equipment Services Integration

Purpose

The Industrial Hygiene Equipment Services (IHES) facility provides Industrial Hygiene equipment calibration and tracking for Hanford. The Site Wide Industrial Hygiene Database (SWIHD) system is a site-wide industrial hygiene tracking system which uses the equipment that IHES has in its database. The SWIHD system has some abilities to track equipment as it is used in the field. As the SWIHD system is developed and deployed, equipment in the IHES database will need to be loaded into the SWIHD database to support all of the Organizations providing Industrial Hygiene services on-site.

Scope

The IHES database and IHES functionality will be added to the SWIHD system. IHES personnel will use the SWIHD system for managing and tracking Industrial Hygiene equipment just as they do now. The SWIHD system will not require any job functions at IHES to change.

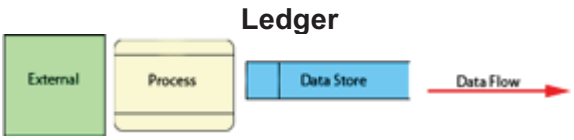
Discussion

The current SWIHD database has a subset of equipment tracking capabilities, similar to those provided by IHES, which are needed to support the operations at Tank Farms. The IHES system is a Microsoft access database solution which has integration limitations to the SWIHD system. Since SWIHD is a SQL Server centralized system, it has the capability to roll up the data from the IHES system. In order to accommodate the needs of IHES, additional functionality specific to IHES will be added to SWIHD. IHES will work closely with the design and development team to insure that all the needs of IHES are addressed as the system is being developed. The IHES functionality will be fully secure and only IHES authorized staff will be allowed to access the system as determined by the IHES administrator.

Process Steps

The process model below represents the functionality which IHES needs to manage and track equipment used on site. This section displays the functions within a dataflow diagram. The components of a dataflow diagram are:

External is a source outside of the database.
Process is activity taking place.
Data Store is a location where information is stored.
Data Flow displays the information going to or coming from the activity(s).



Manage Equipment Check in / out

The process of managing and tracking the equipment used to support the Industrial Hygiene effort on site. This process captures the movement of equipment used in the field along with its calibration and maintenance history.

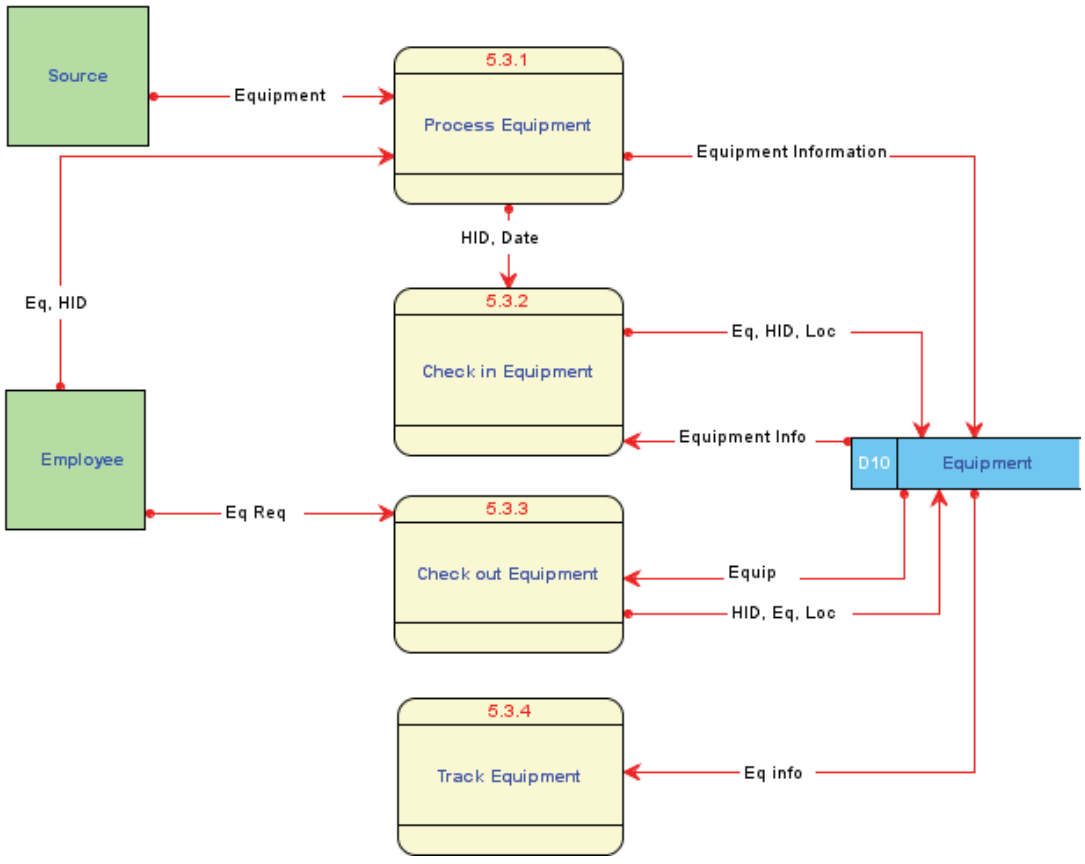


Diagram 3.9.2.1 Manage Equipment Modules Data Flow

Process Equipment

The process of receiving equipment from a source (vendor, employee, other) and entering it into inventory. This process may include returning equipment from the field as well. All equipment information is entered into the database.

Check In Equipment

The process of checking in equipment consists of updating the database to reflect the location and status of the equipment. The status of the equipment is updated to reflect that the equipment has returned to the Lab. The status of the equipment in the Lab is tracked as well, is the equipment being calibrated, repaired or placed on the shelf ready to checked out.

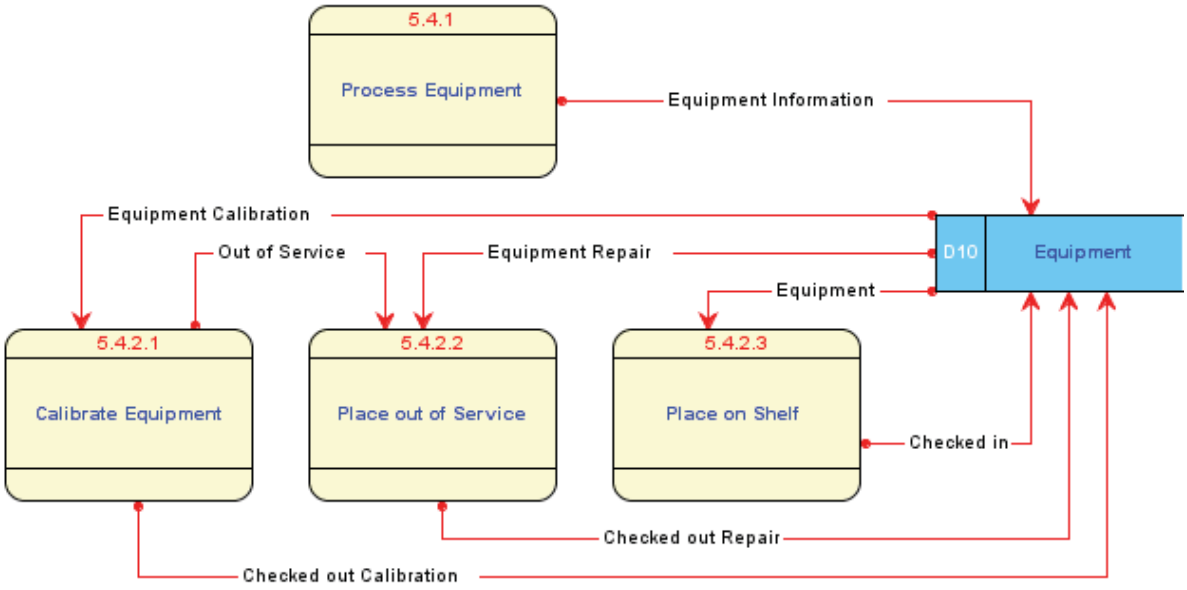


Diagram 3.9.2.1 Check in Equipment Modules Data Flow

Check out Equipment

The process of checking equipment out from the Equipment Lab to individuals consists of collecting the individuals HID and location information.

Track Equipment

The process of tracking equipment by person and location as stored in inventory. The system provides query and reporting facilities to support the needs of the customer.

Requirements:

The requirements of the system are listed below. They appear in process, requirement, and acceptance order. The process is the business function or action which takes place. The requirement is what needs to happen to so the business actually functions. The acceptance criteria are used to measure if the computer system has met the requirement.

Process Equipment

Ability to enter update and maintain equipment records in inventory.

The user can enter new equipment.
The user can edit or update the equipment record.

Ability to scan in equipment and HID information using bar codes located on the equipment and on Hanford ID Card.

The user enters the HID number by hand.
The user enters the equipment number by hand.
The user scans in the HID number.
The user scans in the equipment number.

Check in Equipment

Ability to scan in equipment and HID information using bar codes located on the equipment and on Hanford ID Card.

The user enters the HID number by hand.
The user enters the equipment number by hand.
The user scans in the HID number.
The user scans in the equipment number.

Check out Equipment

System indicates that equipment is available for use and is ready to be checked out.

The user sees all equipment which is available to be checked out.
The user does not see any equipment which is unavailable to be checked out.

The equipment is ready to be checked out when it is added to the pool (shared) or project (owner specific)

The user gets a list of all equipment in the shared pool.
The user gets a list of all equipment in the project by specific owner.

Track Equipment

Track equipment calibration to the IHES facility or Energy Northwest.

The database shows that the equipment is being calibrated by IHES.
The database shows that the equipment is being calibrated by Energy Northwest.
The database shows that the equipment is being calibrated or repaired by vendor or other location.

Send out notifications.

The user creates an out of tolerance notification.

The user selects the equipment recalled by date or date range, and sends out notification.

Track cal gas inventory and history.

The user can list all cal gas historical information.
The user lists all cal gas inventories.

Store multiple bottles of gas to an individual lot number.

The user enters more than one bottle of cal gas to the same lot number.

Search the database for specific equipment information by type, mfg, checked out to and so on…

The user can search the database based upon various criteria.
The user can save search quires and use them over and over.

APPENDIX E - EXPOSURE ASSESSMENT

Exposure Assessment Calculations

Purpose

The purpose of Appendix E is to provide a consistent risk assessment methodology that prioritizes all hazardous agents identified in an exposure assessment.

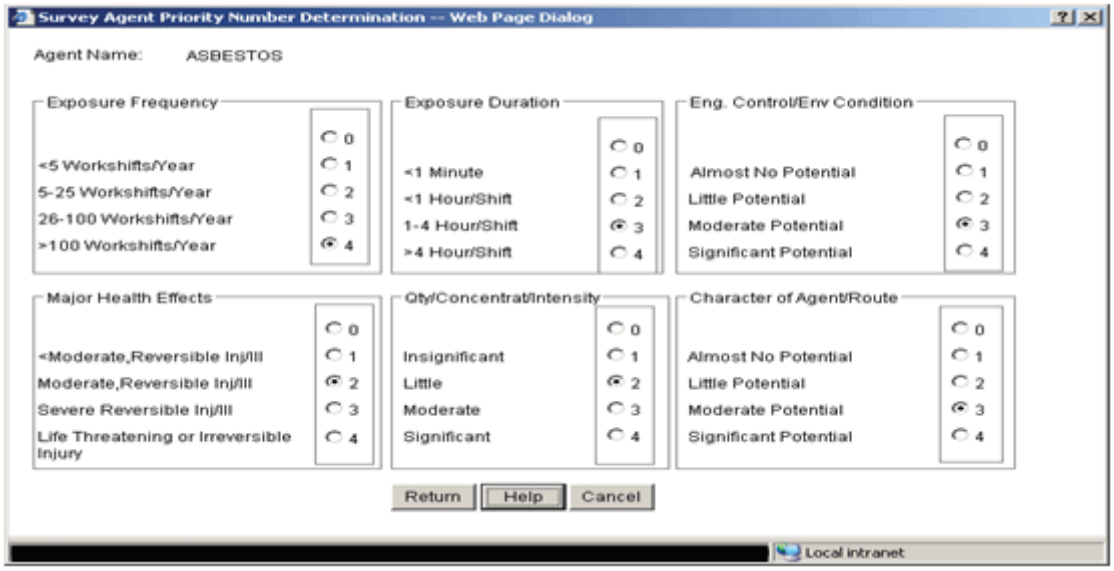
Scope

This appendix provides the Risk Assessment element definitions, value assignment guidelines and calculations to be used during the exposure assessment. It applies to chemical and physical agents, but not biological agents. The outcome is a hazard prioritization rating that can be used in the development of a sampling strategy or can be used as defensible documentation for not sampling. .

Discussion

During the exposure assessment the Industrial Hygienist will rate each hazardous agent. Each hazardous agent is evaluated based on six elements. Each element is evaluated independently of the other elements and assigned a numerical value (1-4) based on the definitions provided. The results are used in a calculation that weights Exposure Frequency, Exposure Duration and Major Health Effects. The result is a Hazard Priority Number.

Example screen



Hazard Characterization Elements

Exposure Frequency	Exposure Duration
(4) > 100 work shifts / year	(4) > 4 hours / shift
(3) 26 -100 work shifts / year	(3) 1 - 4 hours / shift
(2) 5 - 25 work shifts / year	(2) < 1 hour / shift
(1) < 5 work shifts / year	(1) < 1 minute
Exposure Potential A	**Exposure Potential B**
Eng. Controls / Environmental Conditions	Characteristics of agent / route of entry
(4) significant potential for exposure	(4) significant potential for exposure
(3) moderate potential for exposure	(3) moderate potential for exposure
(2) little potential for exposure	(2) little potential for exposure
(1) no potential for exposure	(1) no potential for exposure
Quantity / Concentration / Intensity	**Major Health Effects**
(4) significant	(4) life threatening, or irreversible injury
(3) moderate	(3) sever reversible injury / illness
(2) little	(2) moderate, reversible injury / illness
(1) insignificant	(1) < moderate, reversible injury / illness

Note: Each criterion is evaluated independently and is described below.

Exposure Potential A (engineering controls, environmental conditions)

1. No potential for exposure – for example, any one or more of the following conditions: hazard completely isolated or contained, fail-safe mechanism, no release anticipated.

2. Little potential for exposure – for example, any one or more of the following conditions: exposure not likely under normal conditions, exposure if spill or accident, agents not completely contained but well controlled, working with chemicals in a laboratory hood, standard temperatures.

3. Moderate potential for exposure – for example, any one or more of the following conditions: heating chemical with limited ventilation, some controls available / used, temperature greater than standard, limited shielding, limited barriers.

4. Significant potential for exposure – for example, any one or more of the following conditions: pouring chemicals, open vat, breaking lines, direct contact, high temperatures, high heat, high humidity, no shielding, no barriers.

Exposure Potential B (characteristics of agent, route of entry)

1. No potential for exposure – for example, any one or more of the following conditions: vapor pressure < 0.1 mm Hg at standard temperatures (for an inhalation hazard), non-friable condition for an inhalation hazard, physical agent anticipated to be, or measured to be with an area monitor or direct-reading instrument, present at levels that are < or equal to the action level.

2. Little potential for exposure – for example, any one or more of the following conditions: vapor pressure 0.1-9 mm Hg at standard temperatures (for any inhalation hazard), physical agent anticipated to be, or measured to e with an area monitor or direct-reading instrument, present at levels that are ≥ action level ≤ 0.75 PEL/TLV.

3. Some potential for exposure – for example, any one or more of the following conditions: some dust / vapor / gas can be generated (of an inhalation hazard), vapor pressure 10-99 mm Hg at standard temperature (of an inhalation hazard), physical agent anticipated to be, or measured to be with an monitor or direct-reading instrument, present at levels that are > 0.75 PEL/TLV ≤ PEL/TLV.

4. Significant potential for exposure – for example, any one or more of the following conditions: vapor pressure ≥ 100 mm Hg at standard temperatures (of an inhalation hazard), significant skin absorption properties and direct contact, friable and an inhalation hazard, physical agent anticipated to be, or measured to be with an area monitor or direct-reading instrument, present at levels that are > the OSHA PEL / ACGIH TVL of course this includes whichever of the 8 hr. TWA, excursions, STEL, or ceiling values are applicable).

Quantity / Concentration / Intensity

1. Insignificant – for example, any one or more of the following conditions: < 10 ml of actual material, noise < 80 dBA , temperature 51-79° F; ≤ 9g of material.

2. Little – for example, any one or more of the following conditions: 10 - < 1000 ml of actual material, noise 80 – 82 dBA, temperature 80 – 89° F or 33 – 50° F; > 9g - ≤ 900 g of material.

3. Moderate – for example, any one or more of the following conditions: ≥ liter - < 1 gal of actual material, noise 93 – 85 dBA, temperature 90 -99° F or 20 - 32° F; > 900 g - ≤ 3.6 kg of material.

4. Significant – for example, any one or more of the following conditions: ≥ 1 gal of actual material (i.e., 1 gal of 100% concentrated material, 2 gal of 50% concentrated material, etc.) , noise > 85 dBA, temperature > 100° F or < 20° F; > 3.6 kg material.

Major Health Effects

1. < Moderate injury / illness – short-term skin discoloration, headache, mild irritation, nausea.

2. Moderate, reversible injury / illness – for example, any one or more of the following conditions: moderate irritation, 1st degree burn.

3. Server, reversible injury / illness – for example, any one or more of the following characteristics: severe irritation, severe burns, sensitization.

4. Life threatening or irreversible injury / illness – for example, any one or more of the following characteristics: carcinogens, acute or chronic exposure likely to result in a fatality, blindness, permanent hearing loss, organ / tissue damage.

Model for Calculation Hazardous Agent Priority Number (HPN)

For Task, Project, and Experiment Assessment:

Time				
Exposure frequency	_____	X 1.5=	_____	a
Exposure duration	_____	X 1.5=	_____	b
Exposure Potential				
Exposure potential A	_____	X 1.0=	_____	c
Exposure potential B	_____	X 1.0=	_____	d
Quantity / concentration	_____	X 1.0=	_____	e
Major Health Effects				
Major health effects	_____	X 3.0=	_____	f
			_____	
		Priority Number	_____	

Hazard priority direction

If HPN ≥ 28	Sampling **<u>is required</u>** before or during the next job performance, or as soon as feasible
If HPN > 20 ≤ 27.5	Sampling is a t the discretion of the qualified person
If HPN ≤ 20	Sampling not recommended

For Facility Assessment:

Exposure Potential

Exposure potential A	_____	X 1.0=	_____	c
Exposure potential B	_____	X 1.0=	_____	d
Quantity / concentration	_____	X 1.0=	_____	e

Major Health Effects

Major health effects	_____	X 3.0=	_____	f

_____

Priority Number _____

Hazard priority direction

If HPN ≥ 18	Sampling **is required** as soon as feasible
If HPN > 13 < 18	Sampling is a t the discretion of the qualified person
If HPN < 13	Sampling not recommended

Routine Monitory Program

The frequencies below are provided as guidelines. A sufficient number of samples must be taken for adequately determine the exposure profile. This number is different for different situations and requires the professional judgment of the qualified person.

If initial sampling indicates levels are	Then monitor with this frequency
< ACL *	No further sampling is required
≥ ACL < AL **	Annually
≥ AL < PEL/TLV	Quarterly
≥ PEL / TVL	Monthly

*Note 1: *ACL = Administrative Control Level = 10% of PEL/TLV*

*** AL = Action Level = 50% of PEL/TLV (unless indicated otherwise)*

Note 2: For physical hazards, one may calculate a percentage of the daily allowable dose instead of the PEL/TLV.

Note 3: If no PEL/TLV, then exposure guidelines developed by the Toxic Material Advisory Program (Brookhaven National Laboratory Center for Assessment of Chemical and Physical Hazards) are used.

Note 4: A substance-specific standard may also dictate a monitoring schedule. Choose the most conservative monitoring schedule.

Note 5: The routine monitoring schedule applies to routine operation. For non-routine operations, the qualified person will have to use professional judgment to establish a monitoring schedule and strategy.

APPENDIX F - PORTAL

Portal Interface

Purpose

The system will need to flexible to allow the different organizations to enter and retrieve data without getting bogged down on how the menu will look. This approach allows each organization to have their own look and feel while using the core functionality built on top of a single database repository.

Scope

The portal interface will be designed to be flexible and easy to configure. Each organization will have a designated administrator who will be responsible for working with the organization in defining and configuring the portal.

Discussion

The Site Wide Industrial Hygiene system will have the ability to leverage the latest in technology to meet the needs of each company while not directing or dictating the actions and behavior each company will follow. The portal interface will allow companies to setup not just look and feel but also workflow and access controls specific to their own operations.

Process

Each organization will select the type of menu system they wish to use. The design team will produce choices and work with each organization to capture the look and feel they are striving for. The style sheets will allow each organization to have control over the background, logo's and the items which make up the general overall appeal of the site. Finally the module assemble process will allow each organization to order the processes in such a way that they closely mimic the workflow for the organization. Once these parts are all assembled the organizations portals are ready for user acceptance testing and production use.

APPENDIX G - WORK PLAN

Proposed Work-plan / Schedule

Discussion

The core components which make up the system are Screens, Stored Procedures and Tables.

The current TFIH system has 637 Modules (screens) 631 Stored Procedures 158 Tables.

In order to enable the TFIH system to be fully utilized as a site-wide Industrial Hygiene system, the system has been thoroughly analyzed identifying each screen, procedure and table which needs to be modified to accommodate the requirements outlined in this document. Each element has been assessed and a time estimate has been assigned based upon the scope of work required to make the required changes.

There are 2 options for consideration to move this project ahead to implementation. Note: Loading historical data which is in IDMS will need to be addressed as a separate project.

Option #1

Option #1 utilizes a two phased approach following an accelerated schedule moving the system into production as soon as possible. Phase I addresses all of the required elements to allow organizations to start utilizing the system. Phase II addresses the New Survey Type Project, DRI instrument integration, WSCF integration and HIH2 historical data separately. Phase I will take approximately 10 months to complete and Phase II of the project will take an additional 5 months. Note: Option #1 staffs up for the first 10 months then reduces staffing for the completion of Phase II.

Option #2

Option #2 proposes starting the project next fiscal year. The project duration will be 14 months with a targeted completion date of early December 2011. Note: Option #2 uses the same number of staff for the entire duration of the project.

Recommendation

Option #1 is the recommended approach. It allows for the system to be modified meeting the requirements outlined within this document while offering the quickest deployment date of a site-wide solution.

Function - Requirement - Acceptance

3.3 - Qualitative Review

27 Exposure Assessment - add a flexible exposure assessment module(s). Different organizations will have a need to perform an exposure assessment in response to various situations. Some assessments will be part of a thorough planning process while others will be created dynamically in response to an emergency or some other situation.

The assessment produces a recommended list of hazards to be sampled.

The user makes modifications to the exposure assessment recommendations.

The user documents their recommendations and chooses how to proceed.

The user completes an online exposure assessment form(s).

Peers review and comment on the exposure assessment recommendations.

The user chooses to create an exposure assessment.

3.3.1 - Respond to Defined Need

107 Exposure Assessment - Respond to Need - ability to create exposure assessment worksheet with purpose, location and type.

The user creates an exposure assessment worksheet.

3.3.2 - Determine Scope

108 Exposure Assessment - ability to define the Scope of the exposure assessment.

The use enters the scope for this exposure assessment

3.3.3 - Review the Process

109 Exposure Assessment - Review the process by looking at other similar exposure assessments and sample plans to determine if the hazards warrant continuing with the exposure assessment.

The user opens similar exposure assessments and sample plans for review.

The user determines to continue with the exposure assessment or not.

If user selects continue the sample plan is created.

If user selects not to continue a non-exposure report is created.

3.3.4 - Define Similar Exposure Groups / Contacts

11 Exposure Assessment - SEG - ability to define and track similar exposure group members (SEG) regardless of who wore the sample equipment.

SEG members are available to viewed or reported out from within the IHH system.

User can enter SEG members.

41 Exposure Assessment - SEG - ability to record members in reference to their location/distance from the hazard. (close proximity seg verses other seg/members further away)

The user defines the Location of a SEG in reference to the Hazard.

The user identifies and records the individuals in a SEG.

103 Exposure Assessment - add peer review to the exposure assessment process.

The user is prompted to enter peer review member(s).

104 Exposure Assessment - allow individuals (peer review) to update the exposure assessment, add the ability to store comments by author, date.

The peer review member chooses not to enter comment. A popup window appears "You are required to enter comment to save changes." add button-> "Don't save changes and exit"

The peer review member updates the exposure assessment and is prompted for comment.

User notified that peer review was complete.

User prompted "Accept Changes?"

'Y' User enters electronic authority to accept changes.

'N' User does not accept changes, record is rolled back to before peer updates.

3.3.5 - Assign Risk

45 Exposure Assessment - simplify controls - administrative, engineering, other.

The default Engineering Control and Administrative Controls are loaded from the exposure assessment.

The user enters or updates the engineering and administrative controls.

46 Exposure Assessment - establish and track hazard / agent characteristics used for exposure assessment. (exposure frequency, exposure duration, engineering control - environmental condition, major health effects, qty/concentration/intensity, character of agent/route)

The user reviews and updates the exposure assessment recommendations.

The user completes the exposure assessment worksheet.

60 Exposure Assessment - Field Log - auto fill the eng/admin controls

The user sees the engineering and administrative controls loaded from the exposure assessment.

97 Exposure Assessment - work orders / procedures are preloaded from the exposure assessment. Database to support Project - Subproject - Sub Subproject and so on as defined by organization.

The picklist is filtered by project / task entered in during the exposure assessment.

The user clicks the work order / procedures picklist.

3.4.1 - Respond to Identified Risk

55 Status - Project IH and Surveyor have triggers which are used for project notification when project status changes. Add email notification. Allow each organization to create email notifications as appropriate. (reference Attachment for Tank Farm Changes)

The user sees the status of the survey change as it moves through the process.

The system administrator defines and configures the notification process.

The users receive email notifications depending upon the status of the survey.

3.4.2 - Conduct Peer Review

3 Electronic Authority- add the ability to capture, track and report electronic authority. Verify password against DNS server (ldap).

The user is prompted to enter password. The system validates the password against the user logged in.

The user enters a correct password and is allowed to continue.

The user enters an incorrect password and is required to log off and log back on as the correct user.

103 Exposure Assessment - add peer review to the exposure assessment process.

The user is prompted to enter peer review member(s).

104 Exposure Assessment - allow individuals (peer review) to update the exposure assessment, add the ability to store comments by author, date.

The peer review member chooses not to enter comment. A popup window appears "You are required to enter comment to save changes." add button-> "Don't save changes and exit"

The peer review member updates the exposure assessment and is prompted for comment.

User notified that peer review was complete.

User prompted "Accept Changes?"

'Y' User enters electronic authority to accept changes.

'N' User does not accept changes, record is rolled back to before peer updates.

3.4.3 - Load Sample Plan

102 Exposure Assessment - create and print a sample plan or preload a sample plan or use an existing sample plan or combination of both. Or choose not to use the exposure assessment. If the you choose to use the exposure assessment it will produce either a sample plan or a negative exposure report. If the exposure assessment is used or not, ensure vital documentation exist to support decision.

User chooses not to create an exposure assessment.

User chooses to create an exposure assessment.

The exposure assessment uses an existing sample plan.

The exposure assessment creates a sample plan.

The user modifies the sample plan.

The exposure assessment creates a non-exposure report.

The user chooses not to use the exposure (valid) assessment and is prompted to enter comment.

152 Sample Planning - Exposure Assessment exist for this sample do you want to use it?

The user enters sample plan number.

The system determines sample plan is available in an existing exposure assessment and prompts user "Exposure Assessment exist for this sample do you want to use it?"

"Y" the sample plan is populated from the exposure assessment.

"N" a blank sample template is created.

3.4.4 - Project Oversight

38 Status - of the sample will vary depending upon workflow. Tracking the status of a sample as open, ready, complete or other…

The user sees the status of the sample as it moves through the process.

100 Status - Oversight - Provide project oversight; manage projects; and monitor project status.

The user sees the status of the sample as it moves through the process.

The user displays surveys dependent upon the status selected.

The user has access to a status page.

151 Out of Tolerance - Once out of Tolerance notification is received a report is created displaying all of the surveys affected. The IH conducts a review; 1) updates Survey(s) status, 2) re-analyze survey(s) and stores results as REV1, or enters comment "no impact" and 3) updates IDMS.

User records comment in all surveys regarding out of tolerance notice.

User list all surveys effect.

User receives Out of Tolerance notice.

3.5 - Sample Planning

152 Sample Planning - Exposure Assessment exist for this sample do you want to use it?

The user enters sample plan number.

The system determines sample plan is available in an existing exposure assessment and prompts user "Exposure Assessment exist for this sample do you want to use it?"

"Y" the sample plan is populated from the exposure assessment.

"N" a blank sample template is created.

3.5.1 - Identify Agents (hazards)

110 Sample Planning - Identify Agents by allowing the system to auto load any agents / hazards identified during the exposure assessment or allow the IH/IHT to enter the agents directly.

The user will see on the screen the Job - project description, work order and location.

The user will see pre-loaded agents on the sample plan from the exposure assessment.

The user can load agents onto the sample plan.

3.5.2 - Select Sample Method

111 Sample Planning - Select Sampling Method by allowing the system to auto load the method from the exposure assessment or allow the IH/IHT to enter the method manually.

The user sees the sampling method loaded from the exposure assessment.

The user can load the sampling method filtered by the selected agent.

3.5.3 - Determine Analysis

90 Security - login window needs to have cookies purged at timeout.

The login screen will appear with the fields being blank.

112 Sample Planning - Determine Analysis Method by allowing the system to auto load the information from the exposure assessment or allow the IH/IHT to enter the information.

The user clicks check box - ensuring that the lab can meet the requirements of the sample(s).

The user loads the analysis method.

The user sees the analysis method loaded from the exposure assessment.

3.5.4 - Select Equipment

113 Sample Planning - Selecting Equipment by allowing the system to auto load the information from the exposure assessment or allow the IH/IHT to enter the information.

The user selects equipment filtered by sample type relevant to the agent(s) to be sampled.

The user selects equipment filtered by information from the exposure assessment.

3.5.5 - Determine Data Quality

114 Sample Planning - Determine Data Quality by allowing the system to auto load the information from the exposure assessment or allow the IH/IHT to enter the information.

The user checks the tolerance levels for the equipment and method selected.

The user compares the method flow rates to those of the equipment and method selected.

The user clicks a check box to ensure expected levels are met.

3.5.6 - Conduct Peer Review

55 Status - Project IH and Surveyor have triggers which are used for project notification when project status changes. Add email notification. Allow each organization to create email notifications as appropriate. (reference Attachment for Tank Farm Changes)

The user sees the status of the survey change as it moves through the process.

The users receive email notifications depending upon the status of the survey.

The system administrator defines and configures the notification process.

115 Sample Planning - Conduct Peer Review of the Sample Plan

Peers are notified to review the sample plan.

Peers enter comments with data / time stamp.

The user indicates peer review is complete.

3.6 - Conduct Field Activities

151 Out of Tolerance - Once out of Tolerance notification is received a report is created displaying all of the surveys affected. The IH conducts a review; 1) updates Survey(s) status, 2) re-analyze survey(s) and stores results as REV1, or enters comment "no impact" and 3) updates IDMS.

User records comment in all surveys regarding out of tolerance notice.

User list all surveys effect.

User receives Out of Tolerance notice.

3.6.1 - Create Survey

101 Exposure Assessment - sample plan can filter data to be used on the Survey as appropriate.

The user clicks a picklist on the survey.

The picklist is filtered dependent upon the items selected during the exposure assessment.

116 Field Activities - Create survey - either from the exposure assessment or sample plan.

The survey header information is loaded from the sample plan.

The user clicks create survey and selects sample plan.

153 Sample Planning - no exposure assessment exist for this sample plan do you want to create one?

The system prompts user "No exposure assessment exist do you wish to create one now?"

"Y" an exposure assessment is created from the information entered on the sample plan.

3.6.2 - Gather Equipment

106 Standardize - prompt user if user is different than surveyor.

The user opens an incomplete survey.

The user updates the survey and is prompted "This survey indicates 'name' as the surveyor, Do you wish to continue?"

The user chooses "N" the record is not updated.

The user chooses "Y" to continue and the record is updated.

Changes logged

Status updated to "Last changes made by <name>! Do you wish to save these changes?"

"N" record is rolled back.

118 Field Activities - Gather equipment - ability to enter individual piece(s) of equipment.

The available equipment is selected from a picklist filtered by type or agent.

3.6.3 - Field Check Equipment

106 Standardize - prompt user if user is different than surveyor.

The user opens an incomplete survey.

The user updates the survey and is prompted "This survey indicates 'name' as the surveyor, Do you wish to continue?"

The user chooses "N" the record is not updated.

The user chooses "Y" to continue and the record is updated.

Changes logged

Status updated to "Last changes made by <name>! Do you wish to save these changes?"

"N" record is rolled back.

119 Field Activities - Field Check Equipment - ability to enter pump test results.

The user selects lot or device.

The user records reading(s).

The user indicated if equipment is out of tolerance.

3.6.4 - Conduct Sampling

31 Sample - add sample with a different method dynamically but keep the current method for those samples already entered. Currently system changes the method for all.

The new method shows up for the sample just entered.

All current samples remain unchanged with the original method entered.

The user enters another sample but chooses a different method.

120 Field Activities - Conduct Sample - ability to print field log to take to the site.

The user prints the field log.

3.6.6 - Post Check Equipment

106 Standardize - prompt user if user is different than surveyor.

The user opens an incomplete survey.

The user updates the survey and is prompted "This survey indicates 'name' as the surveyor, Do you wish to continue?"

The user chooses "N" the record is not updated.

The user chooses "Y" to continue and the record is updated.

Changes logged

Status updated to "Last changes made by <name>! Do you wish to save these changes?"

"N" record is rolled back.

121 Field Activities - Post Check Equipment - ability to enter pump test results after returning from the field.

The user selects lot or device.

The user records reading(s).

The user indicated if equipment is out of tolerance.

3.6.8 - Record Field Notes

4 Comments - add ability to load & link objects: word, excel, images, etc. into database. Add blob data type store attached objects in the database. (reference Attachment for Tank Farm Changes)

The user can drag and drop images, documents, spreadsheets, maps into the comments section.

14 DRI - add < D (default detectable limit) if the less than box is checked. Allow the detectable limit to be changed. Break into two fields, display the value entered by the user and the default detectable limit. (reference Attachment for Tank Farm Changes)

The < D appears on the screen when the less than check box is marked.

2 fields appear one with a value entered by the user the other the default detectable limit.

25 Location - add ability to Link Maps to a specific location – if possible add ability to pin location on a map. Store as object in database. (check into caretaker)

The user selects a map, selects the pin icon and places it on the map to indicate the location where the survey was taken.

The map is loaded into the IHH database and is loaded into IDMS along with the Survey.

31 Sample - add sample with a different method dynamically but keep the current method for those samples already entered. Currently system changes the method for all.

The new method shows up for the sample just entered.

All current samples remain unchanged with the original method entered.

The user enters another sample but chooses a different method.

32 Integrate - ability to load DRI Data provided to the system. Either as raw data stored in the database, or convert data into some useful form. Note: To open and read the DataLog files the vendor proprietary software will be required.

User can see DataLog file is stored in the Database.

55 Status - Project IH and Surveyor have triggers which are used for project notification when project status changes. Add email notification. Allow each organization to create email notifications as appropriate. (reference Attachment for Tank Farm Changes)

The users receive email notifications depending upon the status of the survey.

The system administrator defines and configures the notification process.

The user sees the status of the survey change as it moves through the process.

65 Air - Sample Pump - Calibration Device – could have a different cal device when through sampling. Have option to add a secondary cal device. Units of measure should be the same for both cal devices.

The user identifies the cal device after the survey has been completed which is a different device from when the survey was started.

66 Pop List - Sample Pump - Sampling Media / Required Analysis to be split into 2 tiered selections. This means progressive drilldown into the pop list. Add this functionality everywhere as appropriate.

The user places his mouse over the item sought and it fills the field.

The user places the mouse over the sample media; the required analysis for that sample appears to the right in a progressive drilldown box.

106 Standardize - prompt user if user is different than surveyor.

The user opens an incomplete survey.

The user updates the survey and is prompted "This survey indicates 'name' as the surveyor, Do you wish to continue?"

The user chooses "N" the record is not updated.

The user chooses "Y" to continue and the record is updated.

Changes logged

Status updated to "Last changes made by <name>! Do you wish to save these changes?"

"N" record is rolled back.

117 Comments - Retain format in the comments field and on reports.

The user sees the comment displayed and on reports with the same formatting as entered

The user enters the comment with formatting

122 Field Activities - Enter Field Notes - the ability to record the notes from the field.

The user enters field notes into the survey.

3.6.9 - Create COC/Lab Request

55 Status - Project IH and Surveyor have triggers which are used for project notification when project status changes. Add email notification. Allow each organization to create email notifications as appropriate. (reference Attachment for Tank Farm Changes)

The users receive email notifications depending upon the status of the survey.

The system administrator defines and configures the notification process.

The user sees the status of the survey change as it moves through the process.

123 Field Activities - Chain of Custody - ability to print a chain of custody document.

The user prints a chain of custody specific to the users company.

3.6.10 - Take Sample to Lab

55 Status - Project IH and Surveyor have triggers which are used for project notification when project status changes. Add email notification. Allow each organization to create email notifications as appropriate. (reference Attachment for Tank Farm Changes)

The user sees the status of the survey change as it moves through the process.

The users receive email notifications depending upon the status of the survey.

The system administrator defines and configures the notification process.

124 Field Activities - Deliver to Lab - the ability to change the status of the survey to 'Taken to the Lab'

The user clicks a checkbox updating the status as 'Taken to the Lab'

3.7.1 - Analyze Field Activities

125 Evaluate Results - Analyze Field Activities - ability to review completed field work and look for abnormalities.

The user opens the completed survey.

The user records abnormalities in the comments section.

3.7.2 - Conduct IH Reviews

126 Evaluate Results - Calculate Results - ability to review the Lab Results and calculate, or verify the calculation for air concentration (twa, stel)

The user opens lab results from the survey.

The user calculates results.

The user verifies calculations.

The user chicks checkbox 'Lab Results Reviewed'

The status of the survey is updated.

3.7.3 - Receive Results from Lab

33 Integrate - ability to load data from the various labs. Direct load is preferred.

LAB results automatically entered are viewable.

55 Status - Project IH and Surveyor have triggers which are used for project notification when project status changes. Add email notification. Allow each organization to create email notifications as appropriate. (reference Attachment for Tank Farm Changes)

The users receive email notifications depending upon the status of the survey.

The system administrator defines and configures the notification process.

The user sees the status of the survey change as it moves through the process.

128 Evaluate Results - Conduct IH Review - the ability to review the survey, make comments and make status as reveiwed.

The user opens survey.

The user enters IH review notes in the comments field. Comment type 'IH Review'

The user clicks checkbox 'IH Review Complete'

3.7.4 - Calculate Results

129 Evaluate Results - Lab results - the ability to see the results from the LAB via automatic notification.

The user sees status changed on survey to 'Lab Results Available'

The user opens lab results.

3.7.5 - Compare to OEL

130 Evaluate Results - Compare to OEL - ability to compare survey finds against OEL.

The user clicks button - view OEL

The user sees the OEL tied to the survey

3.7.6 - Communicate Results

10 Integrate - IDMS - auto generate IDMS documentation and auto load into IDMS

A new record copy of the file exists in IDMS that matches the current record in IHH.

The PDF file includes any attached files as part of the PDF file.

The record copy document file is in PDF format.

The record is indexed to site-wide IHH standards.

12 Email - add email notification to the system. Automatically generate notification letter for individual, supervisor and others as needed using Organizational specific controls. Note: only 50% of field works may get email in a timely manor.

Different types of email messages are sent for different purposes at different times from within the system.

Email messages are automatically sent to the individuals (by role, IH, IH tech, project lead, etc.) specified on the email configuration screen.

The system administrator sets up or configures the email notification system. (User level choices email notification, internal notification, both)

User only receives email notification under unusual circumstances.

26 Email - if preliminary result from the lab needs immediate timely communication create a email notification to appropriate contact chain.

LAB results trigger an email to appropriate person depending upon the urgency of the results.

55 Status - Project IH and Surveyor have triggers which are used for project notification when project status changes. Add email notification. Allow each organization to create email notifications as appropriate. (reference Attachment for Tank Farm Changes)

The system administrator defines and configures the notification process.

The user sees the status of the survey change as it moves through the process.

The users receive email notifications depending upon the status of the survey.

85 Email - Noise - Letter Notification Comments. Upon Save/Verify the letter gets generated. Add a void/valid check box.

The user can enter or update the Letter Notification area.

The user clicks void / valid to send or not send the letter.

The user clicks save / verify to generate the letter.

131 Evaluate Results - Communicate Results - ability to automatically notify the appropriate individuals.

The user communicates results to appropriate individuals

The status is updated to indicate 'Results Communicated to all appropriate'

151 Out of Tolerance - Once out of Tolerance notification is received a report is created displaying all of the surveys affected. The IH conducts a review; 1) updates Survey(s) status, 2) re-analyze survey(s) and stores results as REV1, or enters comment "no impact" and 3) updates IDMS.

User receives Out of Tolerance notice.

User list all surveys effect.

User records comment in all surveys regarding out of tolerance notice.

3.7.7 - Provide Feedback (closure, path forward)

127 Evaluate Results - Provide Feedback - ability to retrieve comments from the review and provide feedback.

The user opens survey.

The user records observations in the comments field using comment type 'Feedback'

3.8 - Data Mining

1 Reporting - ability to report by project, site, location, individual, SEG or other....

The user creates a report from the database based upon a variety of choices.

The user builds their own adhoc report with the ability to drill down into additional detail.

95 Reporting - add ability to report workers in same work areas who are linked to an actual exposure. (AMH - pull information based upon location, job task, exposure by date and time).

The user produces a report for an individual based upon location, job task, exposure by date and time

The user produces a report listing all works in a SEG based upon location, job task, exposure by date and time

96 Reporting - ability to matchup health trends against workers from IH data.

The user produces a report for an individual based upon location, job task, and exposure by date and time

The user can match up other individuals at the same location, job task and exposure by date and time

The user is able to produce a report with various datapoints and match those datapoints against health trends of the workers

3.8.1 - Define Needed Information

139 Data Modeling - Define Need - ability to create and store query to be used to retrieve data from the data base.

User creates and saves query.

User select saved query and modifies query.

3.8.2 - Retrieve Data

140 Data Modeling - Retrieve Data - the ability to actually retrieve data from the data base.

User runs query

3.8.3 - Evaluate Results

141 Data Modeling - Evaluate Data - the ability to make modifications to the query until the expected results are returned.

User re-runs query

User modifies query and hits save

3.8.4 - Validate Results

142 Data Modeling - Validate Data - ability to produce a set of results from the data base and compare the results to benchmarks to ensure the data is returning the correct information.

User runs query and validates data.

User marks query as "Valid"

3.8.5 - Report Results

1 Reporting - ability to report by project, site, location, individual, SEG or other....

The user builds their own adhoc report with the ability to drill down into additional detail.

The user creates a report from the database based upon a variety of choices.

105 Reporting - add ability to drilldown reporting functionality.

The user selects a report.

The hypertext link drills down into another detailed report based upon keyfield selected.

The report displays data with hypertext links on keyfields.

143 Data Modeling - Report Results - ability to produce reports with accurate data.

User runs report.

3.9.1 - Manage Securty

21 Security - enhance security (function, row, table, item) by user / group. Re build the security module to accommodate the different needs for the different organizations. OUO - requirements must be strictly adhered to.

User will not see the data from within the system they are not authorized to see by user role.

User will be able see selected data but not be allowed to make changes by user role.

User will see the data from within the system they are authorized to see by user role.

91 Security - add a privilege for oversight. Managers/Supervisors can look thru any open, ready, reviewed survey, without any update capability or buttons to change the survey.

The user with full access will only have access to update information in areas where access has been granted.

The user with view only role will not have the ability to update any screens.

The user with limited access will only see data in areas where access is granted.

132 System Administration - Manage Security - ability to set up and configure security.

The administrator opens the security module.

The administrator selects individual to grant right to.

The administrator grants group role access to the system.

Then hits save and closes module. Or

The administrator grants user role access to the system.

The administrator turns on or off access to specific modules.

Then hits save and closes module.

3.9.2 - Configure Navigation

92 Security - add ability to turn off / on functionality including individual items (none required). See functionality of LMSafeLink application created by Lockheed Martin.

The administrator will turn off or on non-required fields by group or user role.

The user will not see non-required fields which have been set to non-display for their group or user role.

133 System Administration - Manage Navigation - ability to setup and configure navigation for each organization

The administrator selects the navigation module.

The administrator selects organization to configure.

The administrator selects menu choice.

The administrator selects CSS style sheet.

The administrator selects module display order. (work flow)

The administrator hits save.

3.9.2.1 - Manage Navigation Modules

92 Security - add ability to turn off / on functionality including individual items (none required). See functionality of LMSafeLink application created by Lockheed Martin.

The administrator will turn off or on non-required fields by group or user role.

The user will not see non-required fields which have been set to non-display for their group or user role.

133 System Administration - Manage Navigation - ability to setup and configure navigation for each organization

The administrator selects the navigation module.

The administrator selects organization to configure.

The administrator selects menu choice.

The administrator selects CSS style sheet.

The administrator selects module display order. (work flow)

The administrator hits save.

3.9.3 - Manage Equipment

8 Wizards - add wizards to allow companies to assemble KIT's (link agent to equipment, equipment to sensor and etc) with equipment for specific sampling.

The user will select equipment for a survey by kit number. (if this organization chooses to use kits)

The Organizations systems administrator will able to setup equipment configurations in a kit or some other grouping will other equipment, sensors, pumps and so on.

16 Integrate - ability to integrate to equipment centers and Labs. - check in/checkout and calibration information is requested. (IHES)

Users in the cal-lab are using the IHH system to check in and check out the equipment.

Equipment status is up-to-date.

Equipment reflects the up-to-date calibration information.

86 Admin - remove Resp Equipment. Section not used under administration. Not used.

The system administration will not see the Resp Equipment tab or link.

87 Wizards - add where needed to setup equipment, analysis, agents…

The system administrator will use wizards to set up and configure equipment, analysis, agents or other.

134 System Administration - Manage Equipment - ability to setup and configure equipment and groups of equipment.

The administrator enters equipment information.

The administrator links the equipment to related equipment (sensors, pumps, etc.)

The administrator links equipment to agents.

3.9.4 - Manage Equipment Check in / out

159 IHES - add comment table to equipment.

Comment will show author and datetime stamp.

User can enter comment attached to the equipment at any time.

3.9.4.1 - Process Equipment

144 IHES - ability to scan in equipment and HID information from bar code on equipment and bar code on Hanford ID Card.

The user enters the HID number by hand.

The user scans in the HID number.

The user enters the equipment number by hand.

The user scans in the equipment number.

156 IHES - Ability to enter update and maintain equipment records in inventory.

The user can enter new equipment.

The user can edit or update the equipment record.

157 IHES - add a comments box which pops up if equipment comes in from the field eairly.

The user will see a comment box attached to the equipment.

The user will see the comment box pop if the equipment is returned before it was schedule.

159 IHES - add comment table to equipment.

Comment will show author and datetime stamp.

User can enter comment attached to the equipment at any time.

3.9.4.2 - Check in Equipment

144 IHES - ability to scan in equipment and HID information from bar code on equipment and bar code on Hanford ID Card.

The user scans in the HID number.

The user scans in the equipment number.

The user enters the equipment number by hand.

The user enters the HID number by hand.

157 IHES - add a comments box which pops up if equipment comes in from the field eairly.

The user will see a comment box attached to the equipment.

The user will see the comment box pop if the equipment is returned before it was schedule.

159 IHES - add comment table to equipment.

Comment will show author and datetime stamp.

User can enter comment attached to the equipment at any time.

3.9.4.3 - Check out Equipment

145 IHES - indicate equipment as available for use when the equipment is ready to be checked out.

The user does not see any equipment which is unavailable to be checked out.

The user sees all equipment which is available to be checked out.

147 IHES - equipment is ready to be checked out when it is added to the pool (shared) or project (owner specific)

The user gets a list of all equipment in the shared pool.

The user gets a list of all equipment in the project by specific owner.

157 IHES - add a comments box which pops up if equipment comes in from the field eairly.

The user will see a comment box attached to the equipment.

The user will see the comment box pop if the equipment is returned before it was schedule.

159 IHES - add comment table to equipment.

Comment will show author and datetime stamp.

User can enter comment attached to the equipment at any time.

3.9.4.4 - Track Equipment

146 IHES - equipment calibration is tracked to the IHES facility, Energy Northwest or other.

The database shows that the equipment is being calibrated by vendor or other location.
Have the ability to store multiple bottles of gas to an individual lot number.

Have the ability to store multiple bottles of gas to an individual lot number.

The database shows that the equipment is being calibrated by IHES.

The database shows that the equipment is being calibrated by Energy Northwest.

148 IHES - send out notifications. This process needs to have the lab technician to verify issue(s) before it sends out the notifications.

The user selects the equipment recalled by date or date range, and sends out notification.

The user creates out of tolerance notification.

149 IHES - ability to track cal gas inventory and history.

The user lists all cal gas inventories.

The user can list all cal gas historical information.

150 IHES - ability to search the database for specific equipment information by type, mfg, checked out to and so on…

The user can search the database based upon various criteria.

The user can save search quires and use then over and over.

154 IHES - store multiple bottles of gas to an individual lot number.

The user enters more then one bottle of cal gas to the same lot number.

157 IHES - add a comments box which pops up if equipment comes in from the field eairly.

The user will see a comment box attached to the equipment.

The user will see the comment box pop if the equipment is returned before it was schedule.

158 IHES - notice of discrepancy will identify who has the equipment out since last calibration and will identify surveys where are effected. The equipment Lab will need to update the findings and send notification.

The user will ask the lab technician to enter issue and calibration readings.

The user will update the notification message.

The user will click "Process Notification"

The notification will go to the last person whom the equipment was assigned.

The notification will include all affected surveys.

159 IHES - add comment table to equipment.

Comment will show author and datetime stamp.

User can enter comment attached to the equipment at any time.

3.9.5 - Manage Locations

25 Location - add ability to Link Maps to a specific location – if possible add ability to pin location on a map. Store as object in database. (check into caretaker)

The map is loaded into the IHH database and is loaded into IDMS along with the Survey.

The user selects a map, selects the pin icon and places it on the map to indicate the location where the survey was taken.

43 Location - ability to setup location and sub-locations as necessary defined by each organization.

User enters GPS coordinates.

User has ability to add additional sub-locations or use the other field.

User only sees Locations specific to their own Organization.

The System Administrator identifies and configures Location / Sub-Locations within the system.

User selects Location / Sub-Location from the picklist.

49 Location - allow for GPS information to be stored in location.

The user enters the GPS coordinates in the location field.

74 Pop-list - Progressive drilldowns will allow the customer to pick rollover items with drilldown items appearing. - Standardize everywhere.

The user selected the right work activity and it fills the field.

The user moves mouse over work activities.

A progressive drilldown box appears to the right with additional choices associated to the work activity selected.

The user clicks work activities or task dropdown.

80 Pop list - Bulk Samples - location to be progressive drill down.

The Bulk Samples adheres to the progressive drilldown standards.

81 Comments - Bulk Samples - add Locations details comment field to auto expand / contract.
Add this functionality to all fields requiring more than one line for display.

The user clicks the comments link. All comments by type appear. The comments fields are auto expandable.

93 Pop list - all areas which use location information will be consistent and use the same lkupLocation tables. Pop list support progressive drilldown feature and partial word match.

User selects time and filed is filled with entire location string.

Items will appear in the poplist that have a partial word match.

The user will click on location picklist and see commonly shared site-wide choices plus organization specific locations.

The user can type in the field and narrow search.

135 System Administration - Manage Locations - ability to setup and configure locations site-wide as well as by individual organization.

The administrator enters location by organization.

The administrator enters sub-location by organization.

3.9.6 - Manage Tables

6 Pop list - drop down or pop list will have the ability to share common choices and allow organizations to have specific items added which only can be selected by the organization who entered the item. The view only functions will allow all those authorized to see the item.

The user will see all site-wide shared items from the picklist.

The user will not see items from the list added by a different organization.

The user will see any items added by their organization.

9 Survey Types - Physiological - add ability to do Physiological Monitoring.

The site-wide system administrator working with the organizations administrator will be able to setup a new sample type configuration, in this case Physiological Monitoring.

The Physiological Monitoring sample type appears in the system and is ready to use.

The user enters and reports out survey data into the Physiological Monitoring.

35 Pop list - add effective dates or buttons to not display items which are no longer available to use. Need to be able to select or display an item off the list within a date range associated with the date of the survey / sample. Also the ability to turn off display if the equipment is in for CALC.

Picklist items within the date-range of the survey are available to select from the list.

Picklist items outside of the data-range of the current survey are not available to select from the the list.

42 Exposure Assessment - setup project and sub-projects (task) for each exposure assessment plan (site-wide and organization).

The System Administration identifies and configures Projects / Sub-Projects in the system.

User only sees projects specific to their own Organization.

The user selects a Project / Sub-Project from the picklist.

47 Pop list - add ability to dynamically add items to pop list by organization. Ability to track, review and approve items added by site administrator / committee.

The user adds a new value to the picklist.

The systems administrator is notified about the new item added to the picklist.

136 System Administration - Manage Table - ability to setup and configure all lookup tables within the system for both site-wide and individual organization use.

The administrator adds value to lookup table(s).

The administrator modifies lookup table(s) to reflect site-wide choice or organizational choice.

The administrator adds valid date range for items.

3.9.7 - Manage Survey / Samples

17 Survey – ability to create, clone or copy survey or components. Set restrictions on what can be cloned, the data which is actually cloned. Ability to turn off or on this function by user.

User clicks a button to copy or clone a survey (or survey component) from an existing survey.

The clone appears.

User validates what is cloned.

38 Status - of the sample will vary depending upon workflow. Tracking the status of a sample as open, ready, complete or other…

The user sees the status of the sample as it moves through the process.

137 System Administration - Manage Survey and Samples - the ability to manage and maintain surveys and sample plans.

The administrator changes survey status.

3.9.8 - Manage Agents

18 Wizards - equipment administration can use a wizard to setup or configure equipment, sensor and its relationship to agents. Add capability for equipment administration to look up instruments based on sensor capability (agent).

System Administrator(s) can link equipment to other equipment or agents.

Users can select an agent and the appropriate equipment by type will be available in the picklist.

138 System Administration - Manage Agents - ability to setup and configure agents

The administrator updates agent(s)

The administrator enters agent(s)

3.10.1 - Enable Audit Controls

3 Electronic Authority- add the ability to capture, track and report electronic authority. Verify password against DNS server (ldap).

The user enters an incorrect password and is required to log off and log back on as the correct user.

The user enters a correct password and is allowed to continue.

The user is prompted to enter password. The system validates the password against the user logged in.

89 Change Controls - log changes at the table, record and field level.

The administrator will access and report out change log files per survey.

3.10.4 - Usability

3 Electronic Authority- add the ability to capture, track and report electronic authority. Verify password against DNS server (ldap).

The user is prompted to enter password. The system validates the password against the user logged in.

The user enters a correct password and is allowed to continue.

The user enters an incorrect password and is required to log off and log back on as the correct user.

29 Reporting - add hypertext links on reports to drill down into details as needed.

The user sees fields within the report which have hypertext links. By clicking on a hypertext link another detailed report appears.

39 Standardize - modules (.cfm) (exp: Job Info should be the same everywhere) (reference Attachment for Tank Farm Changes) - consolidate and remove duplicates.

The user only sees consistent screens no matter if entering a DRI sample, Air sample or any sample.

70 Pop list - Sample - drop down list should be in the same order by as the way they were entered under sample pump.

Dynamic poplist are displayed in order they are created.

72 Standardize - Page headers (Standardize across the system)

Each page has the same header information.

79 WGBT - Note all time is entered in military time with no (:) Example: 1400. Place an example of the time 24:00 next to field right-side. Standardize everywhere.

Right side of the time field is "hhmm"

3.10.7 - Operations

98 Integrate - add ability to load data from WCH. This may require a secure link (sftp) to upload records on periodic bases.

WCH data is integrated into the IHH system at an interval determined by the Site-Wide Administrator of the IHH system.

WCH data appears and is available to view or report against.

4.1 - Corrective Maintenance

2 Search Box - HID - will drive all personal data. All appropriate fields (personal) will be loaded with HID data only. (reference Attachment for Tank Farm Changes)

The user sees contact information, phone(s), organization and etc. To the right of the search field.

The results appear in the search box with the value selected.

The user enters a value into the search box and clicks the search button.

5 Links - add hypertext link to the incomplete items screen to take you directly to the specific item which needs attention. (reference Attachment for Tank Farm Changes)

The user can click on the hypertext link and immediately be re-directed to the incomplete item.

7 Pop list - need ability to allow start typing and use word match.

The picklist will get smaller as the user types.

The user will be able to start typing in a poplist box and get word match results to appear in the picklist.

12 Email - add email notification to the system. Automatically generate notification letter for individual, supervisor and others as needed using Organizational specific controls. Note: only 50% of field works may get email in a timely manor.

Email messages are automatically sent to the individuals (by role, IH, IH tech, project lead, etc.) specified on the email configuration screen.

User only receives email notification under unusual circumstances.

The system administrator sets up or configures the email notification system. (User level choices email notification, internal notification, both)

Different types of email messages are sent for different purposes at different times from within the system.

13 WBGT - change WBGT to Heat Stress. (reference Attachment for Tank Farm Changes)

The user sees Heat Stress instead of WBGT.

15 Standardize - GUI - add auto save feature. If you leave a page or tab changes are automatically saved. Look at rollback and escape options.

The user makes a change then clicks a different TAB or link changes are saved.

22 OEL - Occupational Exposure Limits - capture limits at time of survey creation to be carried ahead with the record.

The user can view or report out the Occupational Exposure Limits at the time of the survey.

The Occupational Exposure Limits at the time of the survey will be stored with the survey.

26 Email - if preliminary result from the lab needs immediate timely communication create a email notification to appropriate contact chain.

LAB results trigger an email to appropriate person depending upon the urgency of the results.

28 Field Log - remove date next to signature

The user no longer sees the date next to the signature.

36 Pop list - make sure similar pop list are in the same display order. (try to reuse the same pop list objects)

Dynamic poplist are displayed in order they are created.

Poplist appear in the same order everywhere.

37 Required analysis - display method in the required analysis field - one method for each required analysis

The user sees the method attached to the required analysis name.

40 Database - add generic SurveyID, locationID, OrganizationID to the database.

The user does not see anything different.

48 Integrate - Weather - ability to track weather conditions for the entire duration of the survey/samples. Just store date / time / location. (indoors/outdoors) in the sample with links to the conditions recorded by date/time.

The user retrieves weather information by entering the date, time and location.

50 Standardize - Job Info - remove: Map: (field) from Job Info (reference Attachment for Tank Farm Changes)

The user sees the same job info screen throughout the system.

The user does not see the map field on the job info screen.

52 Standardize - Job Info - remove: Lead IHT: (field) from job info (reference Attachment for Tank Farm Changes)

The user does not see the Lead IHT field.

54 Comments - a standardized comments area. Allow multiple comments by, type, date time stamp and author.

The user sees the same comments area.

The user can select comment by type.

The user sees the type, comment, date entered and author.

56 DRI - instruments add As Found/As Left- the unit of measure from the bottle gas should show to the right of the box. Calculate the tolerance and turn the Adjusted To (prompt) red if out of a certain percentage of tolerance. Don’t just compare the as found with as left, compare adjusted to as left as well. (reference Attachment for Tank Farm Changes)

The user sees the tolerance determined by the 'As Found' against the 'As Left'.

The user sees the tolerance determined by the 'Adjusted To' against the 'As Left'. The 'Adjusted To' prompt will turn RED.

57 Air - Personal sampling need to be done at the media (sample) level not the pump level.
Collect media information for TWA, STEL, or Excursion.

The user enters TWA, STEL, and Excursion at the media level for the same pump using different media.

58 DRI - Out of tolerance box needs to be auto-filled if the instrument is out of tolerance.

The user sees the 'Out of Tolerance' check box checked if equipment is out of tolerance.

62 DRI - Readings - activity box to become a dropdown for work activity or task.

User picks the activity / task from the list.

63 Unit of measure - the result needs to be calculated into the same unit of measure as the Action Limit. For units other than %, the data needs to be converted to. Two fields need to appear. One ppb other ppm. Whichever is entered the other is converted and displayed. (if entered in ppb and the Action Limit (OEL) unit of measure was ppm, then the ppb gets converted to the same UOM as the OEL)
Basically, have 2 fields, one with the ppb or ppm entered by the user, the other a calculated display only field with the converted value matching the ppb or ppm stored in the OEL for the equipment.

The report shows the ppm or ppb as defined in the OEL.

The field to the right of the value entered by the user displays the converted amount in ppb or ppm from the OEL for the equipment.

The user enters ppb or ppm results from the readings.

69 Run Times - additional time intervals – post-use flow rate (interval 1) and pre-use flow rate (last interval) should be grayed out if additional interval added. Fields could be filled in if someone went in the field with a dry cal to verify the pump flow rates.

Reports reflect prior run time Flow Rate and later run time Post-Use Flow Rate.

The Post-Use Flow Rate on the prior run time is grayed out and made non-enterable.

The user adds another interval to the run times.

The Pre-Flow Rate on the later run time is also grayed out and made non-enterable.

The user enters a time in the later run time Post-Use Flow Rate.

71 Air - Sample Pump & Passive - add required analysis next to the sample number dropdown - where ever it is used.

The sample number - required analysis appears in the poplist

72 Standardize - Page headers (Standardize across the system)

Each page has the same header information.

74 Pop-list - Progressive drilldowns will allow the customer to pick rollover items with drilldown items appearing. - Standardize everywhere.

A progressive drilldown box appears to the right with additional choices associated to the work activity selected.

The user selected the right work activity and it fills the field.

The user moves mouse over work activities.

The user clicks work activities or task dropdown.

77 Location - Surface - allow the Farm field to be updated.

The user updates the location field on the surface module.

78 WBGT - Default WGBT to ”F”

The Default temperature type is set to "F" on the WGBT / Heat Stress module.

79 WGBT - Note all time is entered in military time with no (:) Example: 1400. Place an example of the time 24:00 next to field right-side. Standardize everywhere.

Right side of the time field is "hhmm"

80 Pop list - Bulk Samples - location to be progressive drill down.

The Bulk Samples adheres to the progressive drilldown standards.

81 Comments - Bulk Samples - add Locations details comment field to auto expand / contract.
Add this functionality to all fields requiring more than one line for display.

The user clicks the comments link. All comments by type appear. The comments fields are auto expandable.

82 Bulk Samples - remove ASB Checklist.

The ASB checklist is gone.

83 Noise - add dB next to the SL measurement field

dB appears to the right side of the SL measurement field

84 Noise - break apart Area Sound Level and Personal Sound Level. Break into a dosimeter tab or link and sound level tab or link.

The user clicks the tab or link for Sound Level and a different page appears.

The user enters or updates data on the Sound Level page.

The user clicks the tab or link for Dosimeter and the page appears.

The user enters or updates data on the Dosimeter page.

93 Pop list - all areas which use location information will be consistent and use the same lkupLocation tables. Pop list support progressive drilldown feature and partial word match.

User selects time and filed is filled with entire location string.

The user will click on location picklist and see commonly shared site-wide choices plus organization specific locations.

The user can type in the field and narrow search.

Items will appear in the poplist that have a partial word match.

155 Standardize - Contact information driven by person type.

User enters contact information and designates IH, IHT, SEG, other…

4.2 - Preventative Maintenance

6 Pop list - drop down or pop list will have the ability to share common choices and allow organizations to have specific items added which only can be selected by the organization who entered the item. The view only functions will allow all those authorized to see the item.

The user will not see items from the list added by a different organization.

The user will see all site-wide shared items from the picklist.

The user will see any items added by their organization.

12 Email - add email notification to the system. Automatically generate notification letter for individual, supervisor and others as needed using Organizational specific controls. Note: only 50% of field works may get email in a timely manor.

Email messages are automatically sent to the individuals (by role, IH, IH tech, project lead, etc.) specified on the email configuration screen.

User only receives email notification under unusual circumstances.

Different types of email messages are sent for different purposes at different times from within the system.

The system administrator sets up or configures the email notification system. (User level choices email notification, internal notification, both)

17 Survey – ability to create, clone or copy survey or components. Set restrictions on what can be cloned, the data which is actually cloned. Ability to turn off or on this function by user.

The clone appears.

User validates what is cloned.

User clicks a button to copy or clone a survey (or survey component) from an existing survey.

26 Email - if preliminary result from the lab needs immediate timely communication create a email notification to appropriate contact chain.

LAB results trigger an email to appropriate person depending upon the urgency of the results.

35 Pop list - add effective dates or buttons to not display items which are no longer available to use. Need to be able to select or display an item off the list within a date range associated with the date of the survey / sample. Also the ability to turn off display if the equipment is in for CALC.

Picklist items outside of the data-range of the current survey are not available to select from the the list.

Picklist items within the date-range of the survey are available to select from the list.

47 Pop list - add ability to dynamically add items to pop list by organization. Ability to track, review and approve items added by site administrator / committee.

The systems administrator is notified about the new item added to the picklist.

The user adds a new value to the picklist.

48 Integrate - Weather - ability to track weather conditions for the entire duration of the survey/samples. Just store date / time / location. (indoors/outdoors) in the sample with links to the conditions recorded by date/time.

The user retrieves weather information by entering the date, time and location.

85 Email - Noise - Letter Notification Comments. Upon Save/Verify the letter gets generated. Add a void/valid check box.

The user can enter or update the Letter Notification area.

The user clicks void / valid to send or not send the letter.

The user clicks save / verify to generate the letter.

4.7 - Sofrware Application Security Requirements

21 Security - enhance security (function, row, table, item) by user / group. Re build the security module to accommodate the different needs for the different organizations. OUO - requirements must be strictly adhered to.

User will see the data from within the system they are authorized to see by user role.

User will not see the data from within the system they are not authorized to see by user role.

User will be able see selected data but not be allowed to make changes by user role.

90 Security - login window needs to have cookies purged at timeout.

The login screen will appear with the fields being blank.

91 Security - add a privilege for oversight. Managers/Supervisors can look thru any open, ready, reviewed survey, without any update capability or buttons to change the survey.

The user with limited access will only see data in areas where access is granted.

The user with view only role will not have the ability to update any screens.

The user with full access will only have access to update information in areas where access has been granted.

92 Security - add ability to turn off / on functionality including individual items (none required). See functionality of LMSafeLink application created by Lockheed Martin.

The administrator will turn off or on non-required fields by group or user role.

The user will not see non-required fields which have been set to non-display for their group or user role.

5.5 - Audit

10 Integrate - IDMS - auto generate IDMS documentation and auto load into IDMS

A new record copy of the file exists in IDMS that matches the current record in IHH.

The PDF file includes any attached files as part of the PDF file.

The record copy document file is in PDF format.

The record is indexed to site-wide IHH standards.

89 Change Controls - log changes at the table, record and field level.

The administrator will access and report out change log files per survey.

5.6 - Priorities

10 Integrate - IDMS - auto generate IDMS documentation and auto load into IDMS

A new record copy of the file exists in IDMS that matches the current record in IHH.

The PDF file includes any attached files as part of the PDF file.

The record copy document file is in PDF format.

The record is indexed to site-wide IHH standards.

16 Integrate - ability to integrate to equipment centers and Labs. - check in/checkout and calibration information is requested. (IHES)

Users in the cal-lab are using the IHH system to check in and check out the equipment.

Equipment status is up-to-date.

Equipment reflects the up-to-date calibration information.

32 Integrate - ability to load DRI Data provided to the system. Either as raw data stored in the database, or convert data into some useful form. Note: To open and read the DataLog files the vendor proprietary software will be required.

User can see DataLog file is stored in the Database.

33 Integrate - ability to load data from the various labs. Direct load is preferred.

LAB results automatically entered are viewable.

48 Integrate - Weather - ability to track weather conditions for the entire duration of the survey/samples. Just store date / time / location. (indoors/outdoors) in the sample with links to the conditions recorded by date/time.

The user retrieves weather information by entering the date, time and location.

98 Integrate - add ability to load data from WCH. This may require a secure link (sftp) to upload records on periodic bases.

WCH data appears and is available to view or report against.

WCH data is integrated into the IHH system at an interval determined by the Site-Wide Administrator of the IHH system.

5.7 - Documentation

160 Documentation - on line documentation will be available. How do I?

Customer will be able to click the help icon and a pop up box will appear with How do I? Prompt.

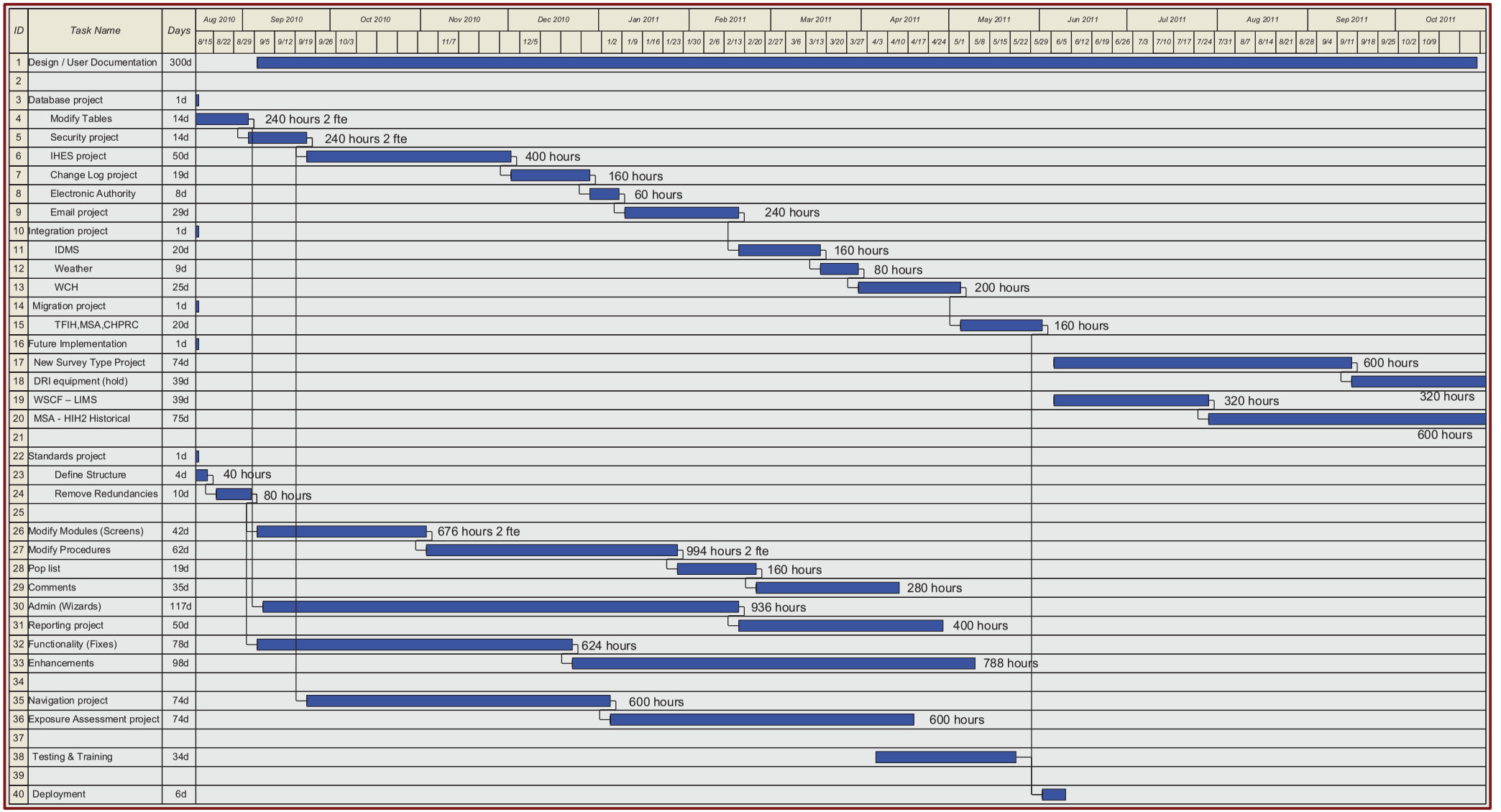
5.9 - Security and Privacy

90 Security - login window needs to have cookies purged at timeout.

The login screen will appear with the fields being blank.

474

Option # 1 Site Wide Industrial Hygiene Database
Design, Development and Deployment Schedule



Option # 2 Site Wide Industrial Hygiene Database
Design, Development and Deployment Schedule