Image Cover Sheet

CLASSIFICATION	SYSTEM NUMBER
UNCLASSIFIED	508757

TITLE

HF-ICADD TRAINING PACKAGE

System Number:

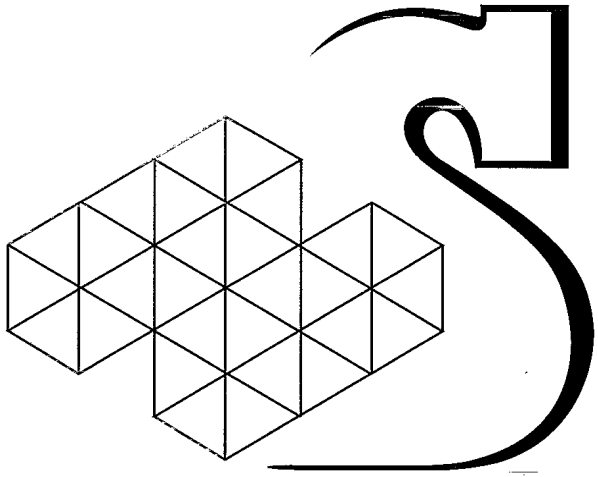
Patron Number:

Requester:

Notes:

DSIS Use only:

Deliver to:



HUMANSYSTEMS
Incorporated

HF-ICADD

Training Package

PWGSC Contract No. W7711-3-7208/01-XSE

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March 1998

DCIEM No. 98-CR-16

HF-ICADD Training Package

by

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PWGSC Contract No.
W7711-3-7208/01-XSE

On behalf of
DEPARTMENT OF NATIONAL DEFENCE

as represented by

Defence and Civil Institute of Environmental Medicine
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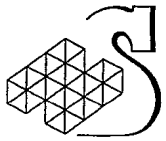
DCIEM Scientific Authority
D. Beevis

March 1998



1. Introduction

This package is intended to support introductory training to the Human Factors Intelligent Computer Aided Design and Drafting (HF-ICADD) software system. It should be used in conjunction with the material in the *HF-ICADD User Manual* for reference to software details, development issues, and training materials (case studies/scenarios).

2. Content

This package uses five types of training materials:

1) Power Point Slides
A slide presentation (paper copy and electronic file) has been developed to be used by a trainer introduce users to HF-ICADD (see Annex A). The 33 slides consist of:

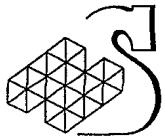
- Agenda.
- Description of the software with graphics.
- Development history.
- Description of likely uses of the software.
- Introduction to an example case study.
- Introduction to a workshop.

2) Training Questionnaire
A brief questionnaire was developed for HF-ICADD User Trials to elicit feedback to assist with development of training content and delivery (see Annex B). This questionnaire can be used following HF-ICADD training sessions to continue development of the training package.

3) Five Step-By-Step Human Factors Compartment Review Case Studies/Scenarios
The five step-by-step case studies or scenarios representing typical Human Factors reviews of ship compartments are found in the Annexes A-E of the *HF-ICADD User Manual*. Each scenario contains introductory instructions which provide the context of the review followed by detailed step by step instructions. The case studies must be used in conjunction with example CADD and Mannequin Model (Safework) files resident on HF-ICADD workstations in each of the directories ".../Scenario.1 to .../Scenario.5".

4) Computer Files and Scenario Props
Computer files (CADD Drawing) and props have been developed for the Case Studies. These files and props supplement the checklist files and some Safework and other drawing files which should be resident on the delivered HF-ICADD workstation (see Annex C).

5) Free Form Scenario (Scenario 6)
A sixth, free form scenario contains introductory instructions and is included in this package (see Annex D).



3. Delivery

The following sections provide information regarding the delivery of HF-ICADD training including expected trainee characteristics, required equipment, recommended agenda and the use of slides. The information is meant as a guideline only (i.e. the equipment configuration, schedule and power point slides should be adapted to meet the needs of specific circumstances).

3.1 Trainees

HF-ICADD training has been designed to be delivered to users who have the following minimal characteristics:

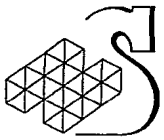
- Good background in computer use (at least at the PC level).
- Some knowledge of CADD.
- Introductory knowledge of Human Factors.
- Some knowledge of Canadian Navy ship design issues.
- Some knowledge of the Canadian Navy ship building/support industry.

Note - It is expected that the trainer will have some knowledge of all of these areas and have good knowledge of Human Factors and the HF-ICADD system.

3.2 Equipment/Setup

Requirements for the training include:

- Conference room with appropriate seating.
- VGA Computer Projector or Overhead Projector.
- Room with at least one HF-ICADD workstation with the complete software installation and appropriate peripherals.
- Technical support staff to configure and maintain the HF-ICADD workstation throughout the training.



3.3 Schedule

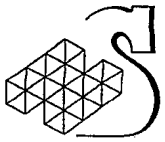
A suggested schedule for 1.5 days of training is shown below. The afternoon of Day 2 may be required for additional scenario and training feedback time depending on the number of:

- Users in the group.
- Complete HF-ICADD workstations.
- Trainees assigned to each workstation.

	Day 1	Day 2
a.m.	Group Introduction Power Point Slides *Break* Example Case Study (*Trainer walks through example case study at workstation as users watch and ask questions.*)	Workshop – Scenarios 4-5 (*Users work through scenarios at own pace.*) Free Form Scenario (*Users work through final scenario at own pace.*) Training Feedback (*Administer Training Feedback Questionnaire.*)
p.m.	Introduction to Workshop (*Complete review of Section 3 of User Manual with users.*) Scenarios 1-3 (*Users work through scenarios at own pace.*)	CONTINGENCY

3.3 Use of Slides

There are 33 slides in the presentation with a mix of text and graphics (see Annex A). Key points are outlined on the text slides. The HF-ICADD interface is explained within the context of an "Example Scenario". Each screen grab is explained by describing the key components within each button, tab, or window, and the resulting task flow within the context of the example scenario.



Annex A - Power Point Slides

This Annex contains power point slides that can be used to provide introductory training to HF-ICADD.

HF-ICADD

Training Module

Today's Agenda

- Introduction
  - » quick overview
- Detailed Description and Development of ICADD
  - break
- Demonstration Case Study
  - lunch
- Work Shop
  - » Five Case Studies
- Training Feedback

Introduction

- Quick overview
  - HF-ICADD developed under a DCIEM contract for DMSS by Genicom, Protogon & Humansystems Incorporated
  - ICADD objective

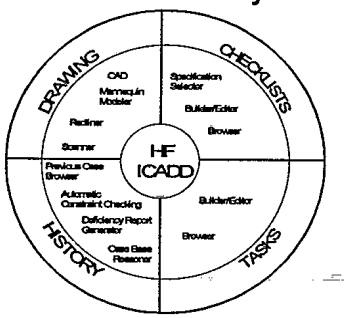
ICADD Objective

"...to improve the capability of the Naval Human Factors cell of the Directorate of Maritime Ship Support (DMSS) to address human factors engineering issues in ship design, particularly design review functions, through the use of a CAD based, modular, intelligent software tool."

Description of HF-ICADD

- UNIX based software on Silicon Graphics Work Station
- Human Factors (in ship design) review tool
  - accepts 2&3D CAD drawings for review and/or mannequin modeling
  - human factors checklist and task database
  - case based reasoning (AI)
- ICADD vs. Commercial Off The Shelf (COTS)
- 4 modules (1. drawing 2. checklist 3. history 4. tasks)

HF-ICADD Layout



Description & Development

- HFICADD
  - CADD tool to support personnel in the ship design cycle who are responsible for the review of Human Factors issues

Introduction

- Example issues include:
  - Habitability
    - » Access/Egress
    - » Space Requirements
  - Operations Issues
    - » Line of sight
    - » Reach
    - » HMI
    - » Communication

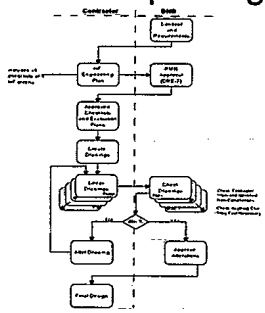
Design Method

- Human Factors Task Analysis
  - determine user requirements
- Iterative Development
  - build & test with users
- Integrated COTS Products
  - code to integrate COTS
  - flexible for many design environments
- Delivered to D.C.I.E.M.

Task Analysis

- Task analysis data based on:
  - The military ship design process in Canada
  - Human factors inputs and outputs to/from this design process
  - DSE-7 (DMSS) human factors activities
  - Canadian ship design contractor human factors activities
  - Hardware and software developments at DSE-7
  - Hardware and software developments at DCIEM
  - Hardware and software developments at Canadian ship design contractors
  - Hardware and software developments in ship design internationally

HF in Ship Design



Key Results

- Contractors design teams will have person responsible for human factors - but may not be a qualified human factors professional
- Contractor staff review layout compliance with contracted checklist
- Experience in ship operations is dispersed throughout the design teams (contractor and DND), with few formal records

Key Results

- Ship design projects in Canada are very long in duration and have high staff turnover potential on both DND and contractor sides. This can result in:
  - » lack of human factors experience
  - » lack of ship operations experience
  - » decisions being made early in design and lost for later stages in design

User Requirements

- Checklist Management System
  - to organize and track deficiencies
  - Checklist Module
- Basic CADD Tool
  - for interoperability
  - MICROSTATION
- Scanner Tool
  - for use with current paper format
  - PIXEL FX

User Requirements

- Drawing Redliner
  - to indicate deficiencies
  - Drawing Module
- 3D Mannequin Tool
  - visualization & complex evaluation
  - SAFEWORK
- Task Database
  - to capture and store task requirements
  - HFICADD

User Requirements

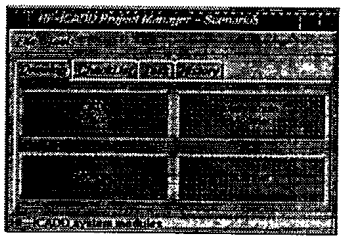
- Case Base Reasoning
  - to capture experience within & between projects
  - to provide automated review tools (where possible)
  - History Module
- Deficiency Report Generator
  - to communicate and track concerns between DND and the contractors
  - HFICADD

Example Scenario

- Obtain Drawing for Review
- Create Checklist for Review
- Use Checklist to Review
- Redline Problem Areas
- Conduct More Complex Trade-of Analyses
- Review Task Data
- Review History
- Produce Integrated Deficiency Report

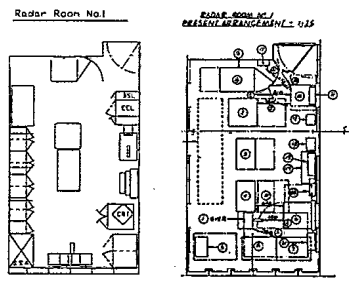
Drawing Module

- CAD (MicroStation)
- Mannequin Modeler (SafeWork)
- Red Liner (CADLeaf)
- Scanner (Pixel FX, with OCR)



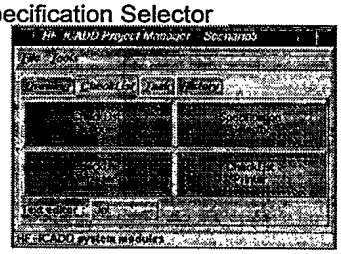
Drawing Module

- CAD
- Scan



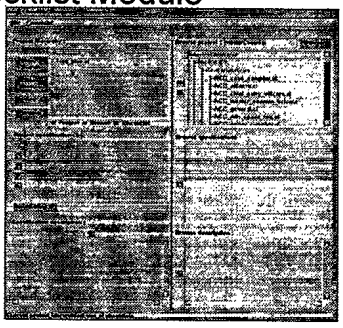
Checklist Module

- Checklist Functions
- Specification Selector



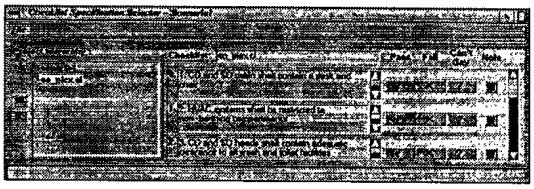
Checklist Module

- Checklist Designer
  - create, browse
  - edit and scan



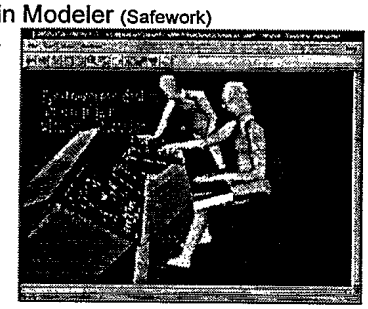
Checklist Module

- Specification Selector
  - pass / fail / can't say/notes



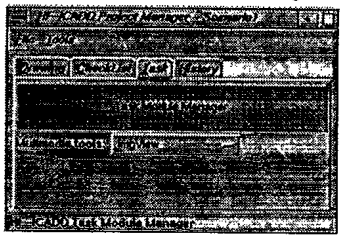
Drawing Module

- Mannequin Modeler (Safework)
- Red Liner (CADLeaf)



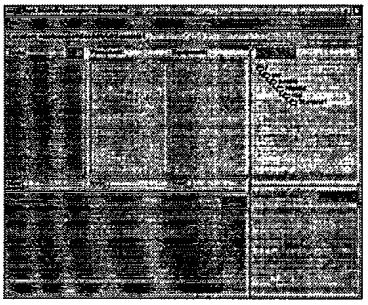
Task Module

- Compartment specific task lists, personnel and equipment
  - Task creation, editing and browsing



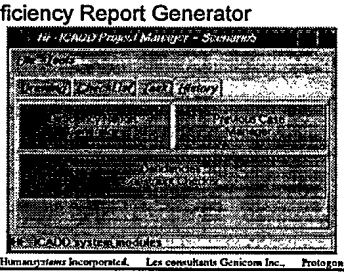
Task Module

- Task description
- Personnel
- Equipment
- Graphic/ Video



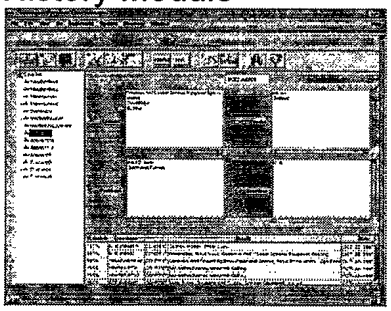
History Module

- Automatic constraint checking
- Previous Case Manager
- Deficiency Report Generator



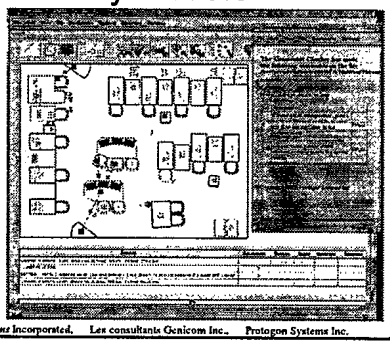
History Module

- Previous Case Browser



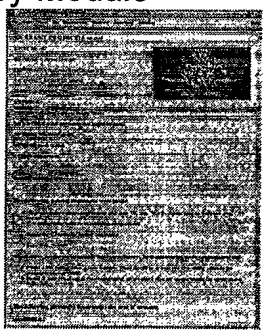
History Module

- Automatic Constraint Checking



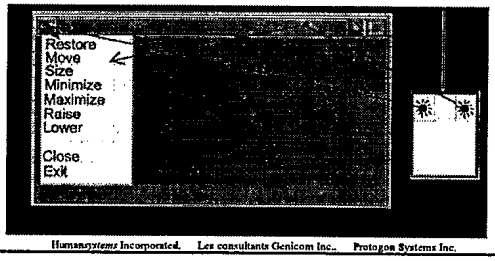
History Module

- Deficiency report generator



Windowing

- Patience for new windows from an icon
- Place new windows with left click
- Multiple, Live, Minimize/Lower etc.



Work Shop

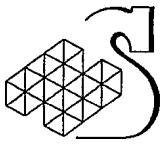
- Five Case Studies With Instructions (plus 1 free form)
  - 1 Review a CAD drawing & complete a checklist
  - 2 Scan and review a drawing using the previous case manager
  - 3 Review a mannequin model using a task list
  - 4 Checklist creation and review
  - 5 Automatic constraint checking & previous case browsing
- Self Instructed at Work Stations
  - work at your own pace
  - try to remember big picture for more complicated task sequences
  - free form scenario and wrap up

Training Feedback

- Feedback on training is important
- Brief questionnaire

Demonstration Case Study

- Log on
- Browse functions
- Open and review CAD drawing
- Open and review checklist
- Mannequin study
- Deficiency report
- Close Applications



Annex B - Training Feedback Questionnaire

This Annex contains a Training Feedback Questionnaire that can be used after the completed training session to assist with development of the HF-ICADD training package.

Training Feedback Questionnaire

Instructions: Please complete steps 1 through 4. Place a mark in the box that most closely reflects your answer.

1. Name

Last Name, First Initial

_____

2. Previous Experience

Prior to this trial, describe your experience with the following systems.

	None	Some	A lot
1. Macintosh Computer	☐	☐	☐
2. PC Computers	☐	☐	☐
3. Silicon Graphics Workstations	☐	☐	☐
4. Sun Workstations	☐	☐	☐
5. Mannequin Modeling	☐	☐	☐
6. CADD	☐	☐	☐

3. Statements

	Strongly Disagree ☹		Neither Agree or Disagree 😐		Strongly Agree ☺
After the training session -					
7. I felt comfortable using ICADD.	☐	☐	☐	☐	☐
8. I was able to perform simple ICADD tasks.	☐	☐	☐	☐	☐
9. I understood the purpose of ICADD.	☐	☐	☐	☐	☐
10. I had a good idea of the location of all of the ICADD functions.	☐	☐	☐	☐	☐
11. I had a good mental model of what ICADD could do.	☐	☐	☐	☐	☐
Scenario information sheets -					
12. The information was clear and easy to understand.	☐	☐	☐	☐	☐
13. The information helped to complete the tasks.	☐	☐	☐	☐	☐
14. The information was sufficient for the tasks.	☐	☐	☐	☐	☐
Overall					
15. Overall, the training session was helpful.	☐	☐	☐	☐	☐
16. Overall, the training session would be sufficient for most users.	☐	☐	☐	☐	☐

4. General Comments (please write on the back of this sheet if more room is required).

17) I would have liked more training in the following areas:

_____

_____

_____

_____

_____

18) The training could be improved by doing the following:

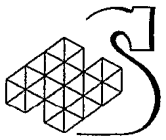
_____

_____

_____

_____

_____



Annex C - Case Study Directories and Supplemental Drawing Files

Following is a description of the directory structures and supplemental CADD drawing files or props required for the Case Studies/Scenarios. These are provided on disk except where noted. It is assumed that the required checklist files are resident on the machine.

Scenario 1

/user/people/hficadd/workshop/scenario.1

- co_plex.rev1.dxf
- co_plex.rev2.dxf

Scenario 2

/user/people/hficadd/workshop/scenario.2

- paper drawing of "Radar Room No 1" (see next page)

Scenario 3

/user/people/hficadd/workshop/scenario.3

- crt_work.rev1.sw (resident on machine)

Scenario 4

/user/people/hficadd/workshop/scenario.4

- 12mess.rev1.dxf
- 12mess.rev2.dxf

Scenario 5

/user/people/hficadd/workshop/scenario5

- mcdv_ops_room.rev1.dxf (resident on machine)

Free Form Scenario (Scenario 6)

/user/people/hficadd/workshop/scenario.6

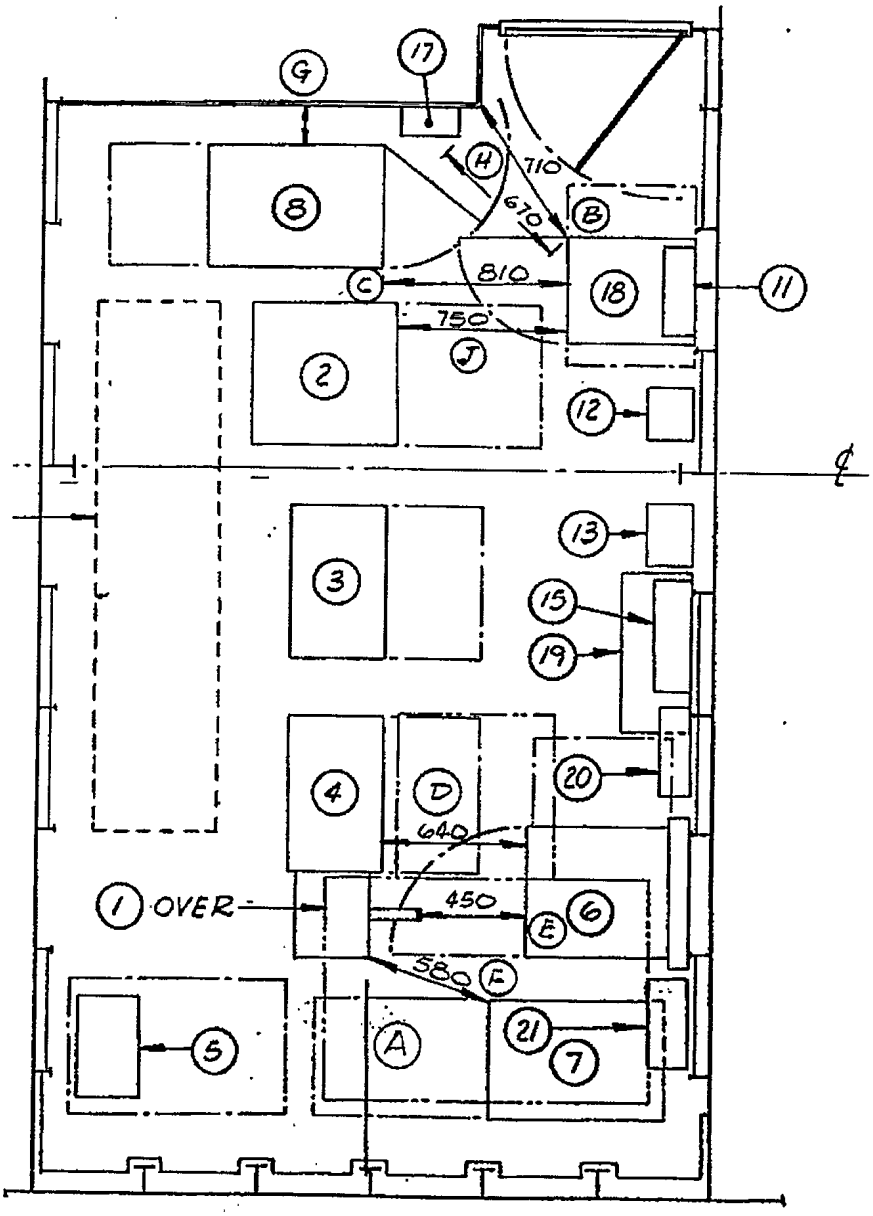
- wardbar.rev1.dxf
- wardbar.rev2.dxf

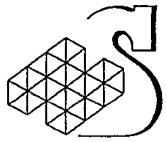
(Note – may need to use one of the "mcdv_ops_room.rev1.dxf" drawings for the automatic constraint checker in Scenario.5 directory.)

Picture for Scenario 2 – Radar Room

This "Radar Room" drawing is used in scenario 2. At the beginning of the scenario, users should be provided with a copy of this drawing to scan in as one of the tasks.

RADAR ROOM Nº. 1
PRESENT ARRANGEMENT - 1:25





Annex D - Instructions for Free Form Scenario 6

There are no instructions for the free form scenario. Instead, please use the following as general guidance:

> *"You are an HF Specialist working for the Canadian Navy. You have been tasked to perform a review of the drawing on disk (in the scenario 6 directory) and provide feedback to the contractor i.e. a deficiency report. We suggest you review the drawing, making use of the automatic constraint checker and previous case manager. To help with the review you may want to create a checklist and task list and then complete the checklist. To better document and convey this feedback information to the contractor, you might illustrate any non-conforming items using the redliner and then combine this with the checklist in a deficiency."*

#508757