

**Ingalls Shipbuilding**

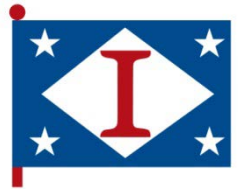
A Division of Huntington Ingalls Industries

# Summary Status of NSRP Hanger Standardization Project

NSRP SDMT Panel Meeting  
June 22, 2011

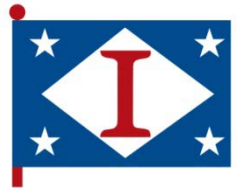
Sean Murphy  
Ingalls Shipbuilding

# Introduction



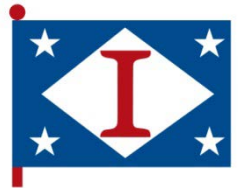
- OBJECTIVE: To improve the accessibility to hanger documentation across shipyards and across classes of ships.
  - Makes hanger information accessible across ship programs (parts commonality) in a digital medium
  - Reduces the labor of re-engineering hanger specs (estimated at \$375K/hull)
  - Guidance document will streamline the process for new hanger approval

# Summary of Plan







- 3 Parts to the Project:
  - Hanger database creation
  - Research of Hanger qualification information and population of database
  - Development of standard hanger qualification process
- Deliverables:
  - A Microsoft database design that provides a means for storing the information and documentation required for each hanger installation and extension
  - A Microsoft Access database of the gathered hanger information
  - A guidance document of new hangers based on the information required

# Hanger Database Development






 = Complete

- Tables:

- Basic Hanger And Qualification Information 
- Cableway Hanger Details 
- Pipe Hanger Details 
- Hot Hanger Details 
- File Attachment input and management 

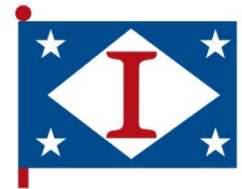
- Forms

- Input for Cableway Hangers 
- Input for Pipe Hangers 
- Input for Hot Hangers 

- Reports

- Pipe Hanger by Size Report 
- Pipe Hanger by Shipyard Qualification Report 

# Initial Hanger and Qualification Information



## BASIC HANGER AND QUALIFICATION INFORMATION

Item Number	Database Generated Identification Number
Shipyards Hanger ID	Shipyards Specific Identification Number
Hanger Type	Pipe, Cableway, or Hot
Nomenclature and Manufacturer	Detailed Hanger Description including manufacturer, if applicable
Original Shipyards	Shipyards Hanger is qualified for
Original Class Design Contract	Ship Class Hanger is qualified for
Drawing Number	Drawing Number for Hanger
Drawing Revision	Revision of the Hanger Drawing
Drawing Date	Date of the Hanger Drawing
Shock Grade of Hanger Assembly (A or B)	A or B
Mounting Location (Deck, Hull, Shell)	Deck, Hull, or Shell
Shock Test Report	Title of Shock Test Report
Shock Extension Report	Title of Shock Extension Report (If Applicable)
Vibration Test Report	Title of Vibration Test Report
Vibration Extension Report	Title of Vibration Extension Report (If Applicable)
CDRL/ Item No./ Date Reference #1	Shipyards or Contract Specific Report (Instance #1)
Approval Letter Reference #1	Approval Letter (Instance #1)
CDRL/ Item No./ Date Reference #2	Shipyards or Contract Specific Report (Instance #2)
Approval Letter Reference #2	Approval Letter (Instance #1)
Shock Qualified (Y/N)	Yes or No
Vibration Qualified (Y/N)	Yes or No
Limitations	Description of any limitations
Comments	Any additional Comments

## Hanger Submittal Form

Shipyards Hanger ID  Shipyards Internal Report:

Hanger Manufacturer

Hanger Nomenclature

Shipyards Design Contract  Original Class Design Contract

Hanger Drawing Number  Hanger Drawing Revision  Hanger Drawing Date

Shock Test Report

Shock Extension Report

Vibration Test Report

CDRL/Item Number/Date

Approval Letter

CDRL/Item Number/Date (2nd Submittal)

Approval Letter (2nd Submittal)

Shock Qualified?  Vibration Qualified?

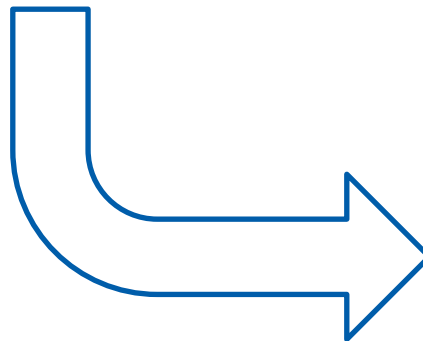
**HANGER TYPE**

Documentation:  (Double Click to Attach)

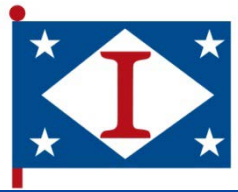
Limitations

Comments

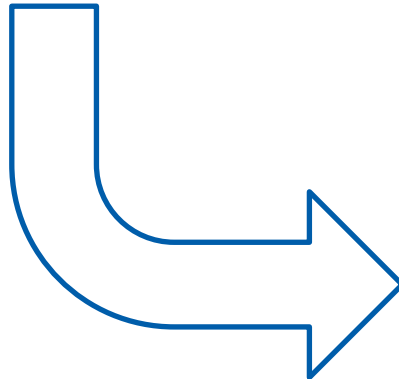
NEW HANGER



# Cableway Hanger Details



CABLEWAY HANGER INFORMATION	
Downcomer	Downcomer Type
	Downcomer Material
	Downcomer Length
	Downcomer Size
	Downcomer Attachment Method
Crosstier	Crosstier Type
	Crosstier Material
	Crosstier Length
	Crosstier Size
	Crosstier Attachment Method
	Crosstier Quantity
	Number/ Size of Cables per crosstier
Miscellaneous	Load Rate per crosstier (Lbs)
	Hanger attachment Method
	Hanger Spacing
	Load Rate per Hanger (lbs)
	Cable Banding Size/ Type/ Material
Cable Orientation	



## Cableway Hanger Details

Shipyard Hanger ID

Downcomer Material

Downcomer Length (In)

Downcomer Size

Downcomer Attachment

Crosstier Type

Crosstier Material

Crosstier Length (In)

Crosstier Size

Crosstier Attachment

Crosstier Quantity:

Number/Size of Cables per Crosstier

Max Load rate per Crosstier (Lbs)

Hanger Attachment



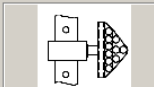


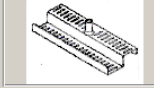
Hanger Spacing (In)

Load rate per Hanger (Lbs)

Cable Banding/Size/Type

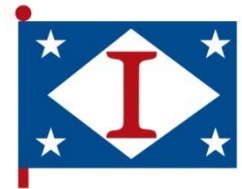
Cable Orientation:

Cableway Type

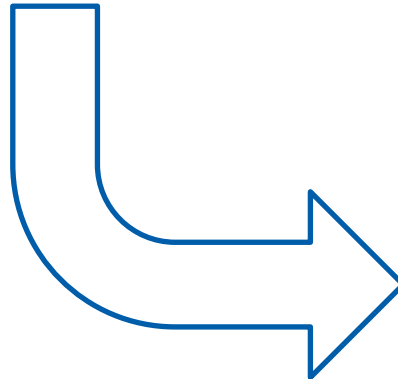
- Trapeze 
- Invert T 
- T Bar 
- U Bracket 
- Crimp Type 
- Shotgun Plate 

Close Form To Return to Hanger Basic

# Pipe Hanger Details



PIPE HANGER INFORMATION	
Downcomer	Downcomer Type
	Downcomer Material
	Downcomer Length
	Downcomer Size
	Downcomer Attachment Method
Clamping Assembly	Clamping Unit Type
	Clamping Material
	Clamp Attachment Method
	Number/ Size of Bolts
	Insulation/ Liner/ Shielding
Miscellaneous	Hanger attachment Method
	Hanger Spacing
	Load Rate per Hanger (lbs)
	Pipe Size
	Pipe Material
	Pipe System Limitation



### Pipe Hanger Details

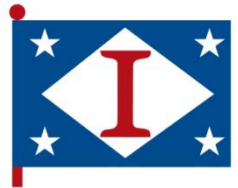
Shipyard Hanger ID:

Downcomer Type	<input type="text"/>	Hanger Orientation:	<input type="text"/>																																								
Downcomer Material	<input type="text"/>	Hanger Spacing (ft)	<input type="text"/>																																								
Downcomer Length (max in)	<input type="text"/>	Load rate per Hanger (lbs)	<input type="text"/>																																								
Downcomer Size	<input type="text"/>	Pipe Material	<input type="text"/>																																								
Downcomer Attachment	<input type="text"/>	Pipe System Limitation	<input type="text"/>																																								
Clamping Unit Type	<input type="text"/>	<b>APPLICABLE PIPE SIZE</b> <table border="0"> <tr> <td>1/8 NPS</td><td><input type="checkbox"/></td> <td>3 NPS</td><td><input type="checkbox"/></td> </tr> <tr> <td>1/4 NPS</td><td><input type="checkbox"/></td> <td>3-1/2 NPS</td><td><input type="checkbox"/></td> </tr> <tr> <td>3/8 NPS</td><td><input type="checkbox"/></td> <td>4 NPS</td><td><input type="checkbox"/></td> </tr> <tr> <td>1/2 NPS</td><td><input type="checkbox"/></td> <td>5 NPS</td><td><input type="checkbox"/></td> </tr> <tr> <td>3/4 NPS</td><td><input type="checkbox"/></td> <td>6 NPS</td><td><input type="checkbox"/></td> </tr> <tr> <td>1 NPS</td><td><input type="checkbox"/></td> <td>8 NPS</td><td><input type="checkbox"/></td> </tr> <tr> <td>1-1/4 NPS</td><td><input type="checkbox"/></td> <td>10 NPS</td><td><input type="checkbox"/></td> </tr> <tr> <td>1-1/2 NPS</td><td><input type="checkbox"/></td> <td>12 NPS</td><td><input type="checkbox"/></td> </tr> <tr> <td>2 NPS</td><td><input type="checkbox"/></td> <td>14 NPS</td><td><input type="checkbox"/></td> </tr> <tr> <td>2-1/2 NPS</td><td><input type="checkbox"/></td> <td></td><td></td> </tr> </table>		1/8 NPS	<input type="checkbox"/>	3 NPS	<input type="checkbox"/>	1/4 NPS	<input type="checkbox"/>	3-1/2 NPS	<input type="checkbox"/>	3/8 NPS	<input type="checkbox"/>	4 NPS	<input type="checkbox"/>	1/2 NPS	<input type="checkbox"/>	5 NPS	<input type="checkbox"/>	3/4 NPS	<input type="checkbox"/>	6 NPS	<input type="checkbox"/>	1 NPS	<input type="checkbox"/>	8 NPS	<input type="checkbox"/>	1-1/4 NPS	<input type="checkbox"/>	10 NPS	<input type="checkbox"/>	1-1/2 NPS	<input type="checkbox"/>	12 NPS	<input type="checkbox"/>	2 NPS	<input type="checkbox"/>	14 NPS	<input type="checkbox"/>	2-1/2 NPS	<input type="checkbox"/>		
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Number/Size of Bolts	<input type="text"/>																																										
Insulation/Liner/Shielding	<input type="text"/>																																										
Hanger Attachment	<input type="text"/>																																										

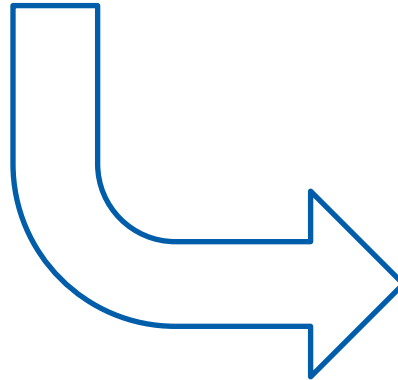
Tube Size (OD-In):

Close Form To Return to Hanger Basic

# Hot Hanger Details



HOT HANGER INFORMATION	
Downcomer	Downcomer Type
	Downcomer Material
	Downcomer Length
	Downcomer Size
	Downcomer Attachment Method
Hanger Clip Assembly	Hanger Clip Type
	Hanger Clip Material
	Hanger Clip Size
	Hanger Clip Bolt Size
Miscellaneous	Hanger Strap Detail
	Hanger Wrapper Detail
	Hanger Attachment
	Hanger Spacing
	Load Rate per Hanger (lbs)
	Hanger Orientation



## Hot Hanger Details

Shipyards  
Hanger ID

Downcomer Type

Hanger Strap Detail

Downcomer Material

Hanger Wrapper Detail

Downcomer Length

Hanger Attachment

Downcomer Size

Hanger Spacing

Downcomer Attachment

Load rate per Hanger

Hanger Clip Type

Hanger Orientation

Hanger Clip Material

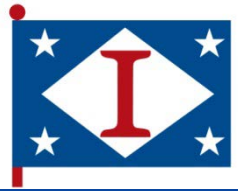
Hanger Clip Length

Hanger Clip Size

Hanger Clip Bolt Size

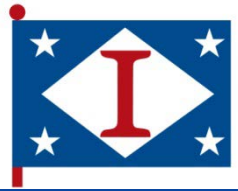
Close Form To Return to Hanger Basic

# Project Status



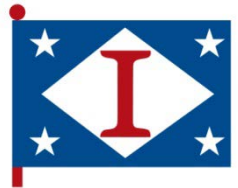
- Collection of Hanger Data (75% complete)
  - Cableway Hangers 80%
  - Pipe Hangers 90%
  - Hot Hangers 0%
- Adding Data into database (48% Complete)
  - Cableway Hangers 80%
  - Pipe Hangers 20%
  - Hot Hangers 0%
- Scanning of File (20% Complete)
  - Cableway Hangers 50%
  - Pipe Hangers 5%
  - Hot Hangers 0%
- Shock Qualification Template(40% Complete)
  - Cableway Hangers 50%
  - Pipe Hangers 0%
  - Hot Hangers 0%

# What we have learned so far



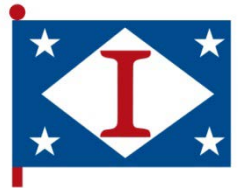
- Database needs to be flexible but still usable
  - Not every hanger easily fits into the forms
  - Queries have to still account for any unusual hanger
- Input forms best manner to put in data
- Database may be an issue when incorporation of hangers from other shipyards is started.
  - Electronic files of reports and approval letters increase required capacity
  - Database size is 340 Mb with only 110 items organized in the database
- Reports from project already benefitting Ship Design
  - Cableway Hanger reports have helped LHA6 Designers with qualification pedigree of hangers being used.

# The Next Step



- Database Development of Tables/Forms
  - Additional forms for editing existing data
  - File Attachment input and management
  - Development of Queries/Reports
  - Validation of overall database
- Collection of Remaining Hanger Data
- Adding Data into database
- Incorporation of advance database tool
  - Security
  - Configuration Management
  - Backup Database capability
  - Sectioning any proprietary information

# Hanger Database - Post project completion



- Turn into a possible NSRP RA project?
  - Incorporation of hangers from other shipyards
  - Development of controls to allow access to other shipyards
- Possible expansion to incorporate other qualification items
  - Light Legs
  - Electrical Standard Methods
  - Piping Standard Methods
  - Stud Mounting

