

LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY  
- LIGO -  
CALIFORNIA INSTITUTE OF TECHNOLOGY  
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

<b>Document Type</b> <b>LIGO-T970180-00 - C</b> 26June97
<b>How to Build the Hanford Left Mid Station EPICS Vacuum Controls System</b>
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*Distribution of this draft:*  
Hanford CDS, Operators

This is an internal working note  
of the LIGO Project..

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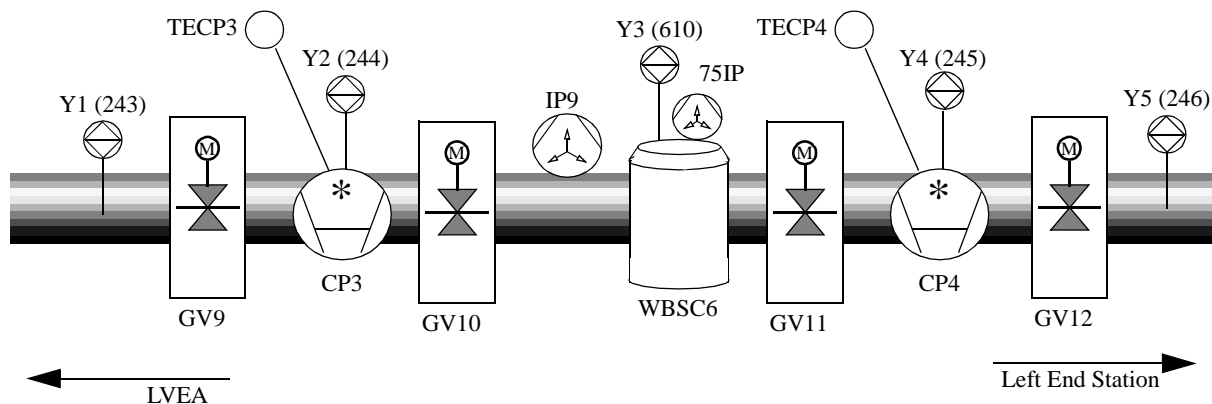
### 1.0 The Hanford Left Mid Station.

The Hanford Left Mid Vacuum Station is designated MY.  
 The Vacuum system comprises:

**Table 1: Hanford MY Vacuum Systems.**

System	#1	#2	#3	#4	#5
Gauge Pairs	X1	X2	X3	X4	X5
Gate Valve	GV9	GV10	GV11	GV12	
Cryo Pumps	CP3	CP4			
Thermocouples	TECP3	TECP4			
2500l/s Ion Pumps	IP9				
75l/s Ion Pumps	75IP				

The vacuum equipment is arranged in the following order:



### 2.0 File Definitions.

**Table 2: File Macro Definitions.**

Macro	Path
\$(GENERIC)	/opt/ligo/b/epics/apple/Hanford/VE/GENERIC
\$(OPI_GENERIC)	/opt/ligo/b/epics/apple/Hanford/VE/opi/medm/GENERIC
\$(MY_TEST)	/opt/ligo/b/epics/apple/Hanford/VE/hanford65/test
\$(CONFIG_MY_TEST)	/opt/ligo/b/epics/apple/Hanford/VE/CONFIG/MY/test
\$(OPI_MY)	/opt/ligo/b/epics/apple/Hanford/VE/opi/medm/MY
\$(ALH_GEN)	/opt/ligo/b/epics/apple/Hanford/VE/alh/GENERIC
\$(ALH_MY)	/opt/ligo/b/epics/apple/Hanford/VE/alh/MY

### 3.0 Database Generation.

#### 3.1 Gauge Pairs (GP)

Gauge Pairs have two databases; the main database and the emulation database. Makefile is \$(CONFIG\_MY\_TEST)/makefile linked into the \$(MY\_TEST) directory. Build the GP system in the \$(MY\_TEST) directory with the command:

```
> make GP
```

##### 3.1.1 Main Database.

Generic db file is \$(GENERIC)/test/database/VE\_GP\_GEN.db (gdct generated).

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MX:GP.config linked into the \$(MY\_TEST) directory.

Output files are HVE-MY:Yn.db and HVE-MY:YnS.db (n=1,2,3,4,5).

##### 3.1.2 Emulation Database.

Generic db file is \$(GENERIC)/test/database/VE\_GPE\_GEN.db (gdct generated).

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:GPE.config linked into the \$(MY\_TEST) directory.

Output files are HVE-MY:YnE.db (n=1,2,3,4,5).

#### 3.2 Electric Gate Valves (GVE).

Only one main db file. Emulation records are in this file. Makefile is \$(CONFIG\_MY\_TEST)/makefile linked into the \$(MY\_TEST) directory. GVE requires access to the Gauge Pair configuration files. Build the GVE system with the command:

```
> make GVE
```

##### 3.2.1 Main Database.

Generic db file is \$(GENERIC)/test/database/VE\_GVE\_GEN.db (gdct generated).

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:GVE.config linked into the \$(MY\_TEST) directory.

Output files are HVE-MY:GVn.db and HVE-MY:GVnS.db (n=9,10,11,12).

#### 3.3 Thermocouples.

Only main db file. Makefile is \$(CONFIG\_MY\_TEST)/makefile linked into the \$(MY\_TEST) directory. Build the TE system with the command:

```
> make TE
```

##### 3.3.1 Main Database.

Generic db file is \$(GENERIC)/test/database/VE\_TE\_GEN.db (gdct generated).

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:TE.config linked into the \$(MY\_TEST) directory.

Output files are HVE-MY:TECPn.db and HVE-MY:TECPnS.db (n=3,4).

#### 3.4 Cryo Pumps.

Two database systems are built, the main database and the emulation database. Makefile is \$(CONFIG\_MY\_TEST)/makefile linked into the \$(MY\_TEST) directory. Build the CP system with the command:

```
> make CP
```

##### 3.4.1 Main Database.

Generic db file is \$(GENERIC)/test/database/VE\_CP\_GEN.db (gdct generated).

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:CP.config linked into the \$(MY\_TEST) directory.

Output files are HVE-MY:CPn.db and HVE-MY:CPnS.db (n=3,4).

##### 3.4.2 Emulation Database.

Generic db file is \$(GENERIC)/test/database/VE\_CPE\_GEN.db (gdct generated).

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:CPE.config linked into the \$(MY\_TEST) directory.

Output files are HVE-MY:CPnE.db (n=3,4).

#### 3.5 2500l/s Ion Pumps.

Only main db file. Makefile is \$(CONFIG\_MY\_TEST)/makefile linked into the \$(MY\_TEST) directory. Build the IP system with the command:

```
> make IP
```

### 3.5.1 Main Database.

Generic db file is \$(GENERIC)/test/database/VE\_IP\_GEN.db (gdct generated).

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:IP.config linked into the \$(MY\_TEST) directory.

Output files are HVE-MY:IP9.db and HVE-MY:IP9S.db.

## 3.6 75I/s Ion Pumps.

Only main db file. Makefile is \$(CONFIG\_MY\_TEST)/makefile linked into the \$(MY\_TEST) directory. Build the 75IP system with the command:

```
> make 75IP
```

### 3.6.1 Main Database.

Generic db file is \$(GENERIC)/test/database/VE\_75IP\_GEN.db (gdct generated).

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:75IP.config linked into the \$(MY\_TEST) directory.

Output files are HVE-MX:75IPBSC6.db and HVE-MX:75IPBSC6S.db.

## 3.7 Pump Carts.

TBD

## 3.8 Full List of Database Files.

**Table 3: Full database db file list.**

System	File #1	File #2	File #3
GP Y1	HVE-MY:Y1.db	HVE-MY:Y1S.db	HVE-MY:Y1E.db
GP Y2	HVE-MY:Y2.db	HVE-MY:Y2S.db	HVE-MY:Y2E.db
GP Y3	HVE-MY:Y3.db	HVE-MY:Y3S.db	HVE-MY:Y3E.db
GP Y4	HVE-MY:Y4.db	HVE-MY:Y4S.db	HVE-MY:Y4E.db
GP Y5	HVE-MY:Y5.db	HVE-MY:Y5S.db	HVE-MY:Y5E.db
GVE GV9	HVE-MY:GV9.db	HVE-MY:GV9S.db	
GVE GV10	HVE-MY:GV10.db	HVE-MY:GV10S.db	
GVE GV11	HVE-MY:GV11.db	HVE-MY:GV11S.db	
GVE GV12	HVE-MY:GV12.db	HVE-MY:GV12S.db	
TE TECP3	HVE-TE:TECP3.db	HVE-TE:TECP3S.db	
TE TECP4	HVE-TE:TECP4.db	HVE-TE:TECP4S.db	
CP CP3	HVE-CP:CP3.db	HVE-CP:CP3S.db	HVE-CPE:CP3.db
CP CP4	HVE-CP:CP4.db	HVE-CP:CP4S.db	HVE-CPE:CP4.db
IP IP9	HVE-IP:IP9.db	HVE-IP:IP9S.db	
75IP 75IPBSC6	HVE-MX:75IPBSC6.db	HVE-MX:75IPBSC6S.db	

## 3.9 Database Totals.

**Table 4: Left Mid Station Totals.**

Number of db files	37
Number of records	389

## 4.0 Sequencer Generation.

### 4.1 Gauge Pairs (GP)

Gauge Pairs have two sequencers; Rate of Rise and RR emulation. Code build makefile is \$(CONFIG\_MY\_TEST)/makefile linked into the \$(MY\_TEST) directory. Build the GP system with the command:

```
> make GP
```

Source code is moved into \$(MY\_TEST)/src. Code compile makefile is in \$(MY\_TEST)/src. Recompile the code for the 162 by running make in \$(MY\_TEST)/target/mv162/obj.

#### 4.1.1 Rate of Rise.

Generic st file is \$(GENERIC)/test/src/VE\_GP\_RR\_GEN.st.

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:GP.config linked into the \$(MY\_TEST) directory.

Output files are HVE\_MY\_YnRR.st (n=1,2,3,4,5).

#### 4.1.2 RR Emulation.

Generic st file is \$(GENERIC)/test/src/VE\_GP\_RRE\_GEN.st

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:GPE.config linked into the \$(MY\_TEST) directory.

Output files are HVE\_MY\_YnERRE.st (n=1,2,3,4,5).

### 4.2 Electric Gate Valves (GVE).

Gate Valves have two sequencers; open and emulation. Code build makefile is \$(CONFIG\_MY\_TEST)/makefile linked into the \$(MY\_TEST) directory. Build the GP system with the command:

```
> make GVE
```

Source code is moved into \$(MY\_TEST)/src. Code compile makefile is in \$(MY\_TEST)/src. Recompile the code for the 162 by running make in \$(MY\_TEST)/target/mv162/obj.

#### 4.2.1 Open.

Generic st file is \$(GENERIC)/test/src/VE\_GVE\_OPEN\_GEN.st.

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:GVE.config.

Output files are HVE\_MY\_GVnOPEN.st (n=9,10,11,12).

#### 4.2.2 Emulation.

Generic st file is \$(GENERIC)/dev/src/VE\_GVEE\_GEN.st.

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:GVE.config.

Output files are HVE\_MY\_GVnGVEE.st (n=9,10,11,12).

### 4.3 Thermocouples.

No Sequencers.

### 4.4 Cryo Pumps.

Two sequencers per Cryo Pump; Liquid Nitrogen Consumption Rate calculation and its emulation system. Code build makefile is \$(CONFIG\_MY\_TEST)/makefile linked into the \$(MY\_TEST) directory. Build the CP system with the command:

```
> make CP
```

Source code is moved into \$(MY\_TEST)/src. Code compile makefile is in \$(MY\_TEST)/src. Recompile the code for the 162 by running make in \$(MY\_TEST)/target/mv162/obj.

#### 4.4.1 LN2 Rate.

Generic st file is \$(GENERIC)/test/src/VE\_CP\_LNRATE\_GEN.st.

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:CPE.config.

Output files are HVE\_MY\_CPnLNRATE.st (n=3,4).

#### 4.4.2 Emulation.

Generic st file is \$(GENERIC)/dev/src/VE\_CP\_LNE\_GEN.st.

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:CPE.config.

Output files are HVE\_MY\_CP4ELNE.st (n=3,4).

**4.5 2500l/s Ion Pumps.**

No Sequencers

**4.6 75l/s Ion Pumps.**

No Sequencers

**4.7 Pump Carts.**

TBD

**4.8 Sequencer Code File Totals.****Table 5: C Code Object File List.**

HVE_MY_Y1RR.o	HVE_MY_Y1ERRE.o
HVE_MY_Y2RR.o	HVE_MY_Y2ERRE.o
HVE_MY_Y3RR.o	HVE_MY_Y3ERRE.o
HVE_MY_Y4RR.o	HVE_MY_Y4ERRE.o
HVE_MY_Y5RR.o	HVE_MY_Y5ERRE.o
HVE_MY_GV9OPEN.o	HVE_MY_GV9GVVEE.o
HVE_MY_GV10OPEN.o	HVE_MY_GV10GVVEE.o
HVE_MY_GV11OPEN.o	HVE_MY_GV11GVVEE.o
HVE_MY_GV12OPEN.o	HVE_MY_GV12GVVEE.o
HVE_MY_CP3LNRATE.o	HVE_MY_CP3ELNE.o
HVE_MY_CP4LNRATE.o	HVE_MY_CP4ELNE.o

**5.0 C Code Generation.****5.1 Gauge Pairs.**

C code used for Pirani gauge vacuum calculation. No code generation is needed. Source code is in \$(GENERIC)/test/src and is linked into the \$(MY\_TEST)/src directory. Code compile makefile is in the \$(MY\_TEST)/src directory. Recompile the code for the 162 by running make in \$(MY\_TEST)/test/target/mv162/obj.

**5.1.1 Pirani Vacuum.**

Source code is \$(GENERIC)/test/src/VE\_GP\_PIRANI\_CVT\_TORR.c

No generation needed. This code is re-entrant and only one copy of the object code is required on the IOC.

Output file is in \$(MY\_TEST)/test/target/mv162/obj directory, file is VE\_GP\_PIRANI\_CVT\_TORR.o.

**5.2 Electric Gate Valves.**

No C Code.

**5.3 Thermocouples.**

No C Code.

**5.4 Cryo Pumps.**

C code used to perform pump LN2 level control. No code generation is needed. Source code is in \$(GENERIC)/test/src and is linked into the \$(MY\_TEST)/src directory. Code compile makefile is in the \$(MY\_TEST)/src directory. Recompile the code for the 162 by running make in \$(MY\_TEST)/test/target/mv162/obj.

#### 5.4.1 Pump LN2 Level Control.

Source code is \$(GENERIC)/test/src/VE\_CP\_LVLCTRL.c

No generation needed. This code is re-entrant and only one copy of the object code is required on the IOC.

Output file is in \$(MY\_TEST)/test/target/mv162/obj directory, file is VE\_CP\_LVLCTRL.o.

### 5.5 2500l/s Ion Pumps.

No C Code.

### 5.6 75l/s Ion Pumps.

C code used to convert Pump Current to Vacuum. Used for the ion pumps in the 75IP systems and in the Gate Valve systems. Source code is in \$(GENERIC)/test/src and is linked into the \$(MY\_TEST)/src directory. Code compile makefile is in the \$(MY\_TEST)/src directory. Recompile the code for the 162 by running make in \$(MY\_TEST)/test/target/mv162/obj.

#### 5.6.1 Pump current to vacuum conversion.

Source code is \$(GENERIC)/test/src/VE\_GVE\_AMPS\_TO\_TORR.c

No generation needed. This code is re-entrant and only one copy of the object code is required on the IOC.

Output file is in \$(MY\_TEST)/test/target/mv162/obj directory, file is VE\_GVE\_AMPS\_TO\_TORR.o.

### 5.7 Pump Carts.

TBD.

### 5.8 C Code File Totals.

**Table 6: C Code Object File List.**

VE_GP_PIRANI_CVT_TORR.o
VE_CP_LVLCTRL.o
VE_AMPS_TO_TORR.o

## 6.0 MEDM Screens Generation.

### 6.1 Gauge Pairs (GP).

Gauge Pairs have three displays; main, simulation and emulation. Makefile is \$(OPI\_MY)/makefile, build the GP displays with the command;

```
make GP
```

Configuration files are symbolic linked from \$(CONFIG\_MY\_TEST) to the current directory.

#### 6.1.1 Main.

Generic adl file is \$(OPI\_GENERIC)/VE\_GP\_GEN.adl (MEDM generated).

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:GP.config.

Output file is \$(OPI\_MY)/HVE-MY:Yn.adl (n=1,2,3,4,5).

#### 6.1.2 Simulation.

Generic adl file is \$(OPI\_GENERIC)/VE\_GP\_GEN\_S.adl (MEDM generated).

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:GP.config.

Output file is \$(OPI\_MY)/HVE-MY:YnS.adl (n=1,2,3,4,5).

#### 6.1.3 Emulation

Generic adl file is \$(OPI\_GENERIC)/VE\_GP\_GEN\_E.adl (MEDM generated).

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:GPE.config.

Output file is \$(OPI\_MY)/HVE-MY:YnEE.adl (n=1,2,3,4,5).

### 6.2 Electric Gate Valves (GVE).

Gate Valves have two displays; main and emulation. Makefile is \$(OPI\_MY)/makefile, build the GVE displays with the com-

mand;

**make GVE**

Configuration files are symbolic linked from \$(CONFIG\_MY\_TEST) to the current directory.

6.2.1 Main.

Generic adl file is \$(OPI\_GENERIC)/VE\_GVE\_GEN.adl (MEDM generated).

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:GVE.config.

Output file is \$(OPI\_MY)/HVE-MY:GVn.adl (n=9,10,11,12).

6.2.2 Emulation.

Generic adl file is \$(OPI\_GENERIC)/VE\_GVE\_GEN\_E.adl (MEDM generated).

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:GVE.config.

Output file is \$(OPI\_MY)/HVE-MY:GVnE.adl (n=9,10,11,12).

### 6.3 Thermocouples.

Thermocouples have two displays;main and simulation. Makefile is \$(OPI\_MY)/makefile, build the TE displays with the command;

**make TE**

Configuration files are symbolic linked from \$(CONFIG\_MY\_TEST) to the current directory.

6.3.1 Main.

Generic adl file is \$(OPI\_GENERIC)/VE\_TE\_GEN.adl (MEDM generated).

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:TE.config.

Output file is \$(OPI\_MY)/HVE-MY:TE.adl.

6.3.2 Simulation.

Generic adl file is \$(OPI\_GENERIC)/VE\_TE\_GEN\_S.adl (MEDM generated).

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:TE.config.

Output file is \$(OPI\_MY)/HVE-MY:TES.adl.

### 6.4 Cryo Pumps.

Cryo Pumps have three displays; main, simulation and emulation. Makefile is \$(OPI\_MY)/makefile, build the CP displays with the command;

**make CP**

Configuration files are symbolic linked from \$(CONFIG\_MY\_TEST) to the current directory.

6.4.1 Main.

Generic adl file is \$(OPI\_GENERIC)/VE\_CP\_GEN.adl (MEDM generated).

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:CP.config.

Output file is \$(OPI\_MY)/HVE-MY:CPn.adl (n=3,4).

6.4.2 Simulation.

Generic adl file is \$(OPI\_GENERIC)/VE\_CP\_GEN\_S.adl (MEDM generated).

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:CP.config.

Output file is \$(OPI\_MY)/HVE-MY:CPnS.adl (n=3,4).

6.4.3 Emulation

Generic adl file is \$(OPI\_GENERIC)/VE\_CP\_GEN\_E.adl (MEDM generated).

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:CPE.config.

Output file is \$(OPI\_MY)/HVE-MY:CPnEE.adl (n=3,4).

### 6.5 2500/s Ion Pumps.

Large ion pumps have two displays;main and simulation. Makefile is \$(OPI\_MY)/makefile, build the IP displays with the command;

**make IP**

Configuration files are symbolic linked from \$(CONFIG\_MY\_TEST) to the current directory.



## 6.5.1 Main.

Generic adl file is \$(OPI\_GENERIC)/VE\_IP\_GEN.adl (MEDM generated).

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:IP.config.

Output file is \$(OPI\_MY)/HVE-MY:IP9.adl.

## 6.5.2 Simulation.

Generic adl file is \$(OPI\_GENERIC)/VE\_IP\_GEN\_S.adl (MEDM generated).

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:IP.config.

Output file is \$(OPI\_MY)/HVE-MY:IP9S.adl.

**6.6 75I/s Ion Pumps.**

75I/s ion pumps have two displays;main and simulation. Makefile is \$(OPI\_MY)/makefile, build the 75IP displays with the command;

```
make 75IP
```

Configuration files are symbolic linked from \$(CONFIG\_MY\_TEST) to the current directory.

## 6.6.1 Main.

Generic adl file is \$(OPI\_GENERIC)/VE\_75IP\_GEN.adl (MEDM generated).

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:75IP.config.

Output file is \$(OPI\_MY)/HVE-MY:75IPBSC6.adl.

## 6.6.2 Simulation.

Generic adl file is \$(OPI\_GENERIC)/VE\_75IP\_GEN\_S.adl (MEDM generated).

Configuration file is \$(CONFIG\_MY\_TEST)/HVE-MY:75IP.config.

Output file is \$(OPI\_MY)/HVE-MY:75IPBSC6S.adl.

**6.7 Pump Carts.**

TBD

**6.8 MEDM File Totals.**

**Table 7: MEDM File List.**

HVE-MY:Y1.adl	HVE-MY:Y1S.adl	HVE-MY:Y1EE.adl
HVE-MY:Y2.adl	HVE-MY:Y2S.adl	HVE-MY:Y2EE.adl
HVE-MY:Y3.adl	HVE-MY:Y3S.adl	HVE-MY:Y3EE.adl
HVE-MY:Y4.adl	HVE-MY:Y4S.adl	HVE-MY:Y4EE.adl
HVE-MY:Y5.adl	HVE-MY:Y5S.adl	HVE-MY:Y15EE.adl
HVE-MY:GV9.adl	HVE-MY:GV9E.adl	
HVE-MY:GV10.adl	HVE-MY:GV10E.adl	
HVE-MY:GV11.adl	HVE-MY:GV11E.adl	
HVE-MY:GV12.adl	HVE-MY:GV12E.adl	
HVE-MY:TE.adl	HVE-MY:TES.adl	
HVE-MY:CP3.adl	HVE-MY:CP3S.adl	HVE-MY:CP3EE.adl
HVE-MY:CP4.adl	HVE-MY:CP4S.adl	HVE-MY:CP4EE.adl
HVE-MY:IP9.adl	HVE-MY:IP9S.adl	
HVE-MX:75IP.adl	HVE-MX:75IPS.adl	

Total number of adl files=35.

Total number of channels monitored and/or controlled = 687.

## 7.0 Alarm Handler Generation.

### 7.1 Gauge Pairs.

Generic alh config include file is \$(ALH\_GEN)/VE\_GP\_GEN.alhConfig linked into \$(ALH\_MY). MY Vacuum template file is \$(ALH\_MY)/VacTemplate.alhConfig. Makefile is \$(ALH\_MY)/makefile, build the Alarm Handler files with the command;

**make**

Configuration files are symbolic linked from \$(CONFIG\_MY\_TEST) to the current directory. Output file for the MY system is MY.alhConfig.

### 7.2 Thermocouples.

Generic alh config include file is \$(ALH\_GEN)/VE\_TE\_GEN.alhConfig linked into \$(ALH\_MY). MY Vacuum template file is \$(ALH\_MY)/VacTemplate.alhConfig. Makefile is \$(ALH\_MY)/makefile, build the Alarm Handler files with the command;

**make**

Configuration files are symbolic linked from \$(CONFIG\_MY\_TEST) to the current directory. Output file for the MY system is MY.alhConfig.

### 7.3 Gate Valves.

Generic alh config include file is \$(ALH\_GEN)/VE\_GVE\_GEN.alhConfig linked into \$(ALH\_MY). MY Vacuum template file is \$(ALH\_MY)/VacTemplate.alhConfig. Makefile is \$(ALH\_MY)/makefile, build the Alarm Handler files with the command;

**make**

Configuration files are symbolic linked from \$(CONFIG\_MY\_TEST) to the current directory. Output file for the MY system is MY.alhConfig.

### 7.4 Cryo Pumps.

Generic alh config include file is \$(ALH\_GEN)/VE\_CP\_GEN.alhConfig linked into \$(ALH\_MY). MY Vacuum template file is \$(ALH\_MY)/VacTemplate.alhConfig. Makefile is \$(ALH\_MY)/makefile, build the Alarm Handler files with the command;

**make**

Configuration files are symbolic linked from \$(CONFIG\_MY\_TEST) to the current directory. Output file for the MY system is MY.alhConfig.

### 7.5 2500l/s Ion Pumps.

Generic alh config include file is \$(ALH\_GEN)/VE\_IP\_GEN.alhConfig linked into \$(ALH\_MY). MY Vacuum template file is \$(ALH\_MY)/VacTemplate.alhConfig. Makefile is \$(ALH\_MY)/makefile, build the Alarm Handler files with the command;

**make**

Configuration files are symbolic linked from \$(CONFIG\_MY\_TEST) to the current directory. Output file for the MY system is MY.alhConfig.

### 7.6 75l/s Ion Pumps.

Generic alh config include file is \$(ALH\_GEN)/VE\_75IP\_GEN.alhConfig linked into \$(ALH\_MY). MY Vacuum template file is \$(ALH\_MY)/VacTemplate.alhConfig. Makefile is \$(ALH\_MY)/makefile, build the Alarm Handler files with the command;

**make**

Configuration files are symbolic linked from \$(CONFIG\_MY\_TEST) to the current directory. Output file for the MY system is MY.alhConfig.

### 7.7 Pump Carts.

TBD

**7.8 Final Files**

The output from alh generation is a single alh config file for the entire building.

**Table 8: Alarm Handler Configuration File List.**

MY.alhConfig
--------------

Total number of channels monitored for alarm activity on Left Mid Station = 39.

**8.0 SAMMI Screens Generation.****8.1 Gauge Pairs.**

TBD

**8.2 Thermocouples.**

TBD

**8.3 Gate Valves.**

TBD

**8.4 Cryo Pumps.**

TBD

**8.5 2500l/s Ion Pumps.**

TBD

**8.6 75l/s Ion Pumps.**

TBD

**8.7 Pump Carts.**

TBD

**9.0 BURT Generation.****9.1 Gauge Pairs.**

TBD

**9.2 Thermocouples.**

TBD

**9.3 Gate Valves.**

TBD

**9.4 Cryo Pumps.**

TBD

**9.5 2500l/s Ion Pumps.**

TBD

**9.6 75l/s Ion Pumps.**

TBD

**9.7 Pump Carts.**

TBD

**10.0 Archiver Generation.**

**10.1 Gauge Pairs.**

TBD

**10.2 Thermocouples.**

TBD

**10.3 Gate Valves.**

TBD

**10.4 Cryo Pumps.**

TBD

**10.5 2500l/s Ion Pumps.**

TBD

**10.6 75l/s Ion Pumps.**

TBD

**10.7 Pump Carts.**

TBD