

# MCGUIRE NUCLEAR RP CUSTOMER SERVICE IMPROVEMENT

**June 2018**

Duke Energy McGuire



# MCGUIRE NUCLEAR

- ▣ 2 Unit PWR  
Westinghouse reactors
- ▣ 2,200 megawatt
- ▣ Ice Condenser Plant
- ▣ Commercial Operation
  - Unit 1 1981
  - Unit 2 1984
- ▣ Duke Energy



# 2018 Dose Expectations

- ▣ Industry Standard Expectations
  - On-Line Dose Budget 17.021 Rem (SRD)
  - Outage Dose Budget 56.046 Rem (SRD)
  
- ▣ MNS Performance
  - On- Line Dose Performance 2.368 Rem (SRD) of 17.021
  - Outage Dose Performance None till Fall
  - Forced Outage No dose added at this time

# 2018 Dose Performance Barriers

- Time allowance to develop the right plan
- Planning with 34 yrs PM/PT, information not up to date
- Proper information, to many process's with no bang
- Limited RP resource
- Dose savings measured in mrem

# 2018 Dose Accumulation

- ▣ ALARA comes to mind first:
  - Time, Distance, Shielding benefit
  - Reduce accumulated dose
- ▣ Identify the audience.
  - Who is accumulating dose?
  - How much does the worker retain?
- ▣ MNS from 1/1/2018 to 5/9/2018
  - 22,300 RCA entries by workers
  - 2,452 mr dose from RCA entries

# Evaluation Process

- ▣ So we can determine the best fix, let's put it under the microscope:



# Evaluation Process

- ▣ So we can determine the best fix, let's put it under the microscope:
  - ▣ Start with questions.



- ▣ Surveys, Planning, Pictures, Area Monitoring

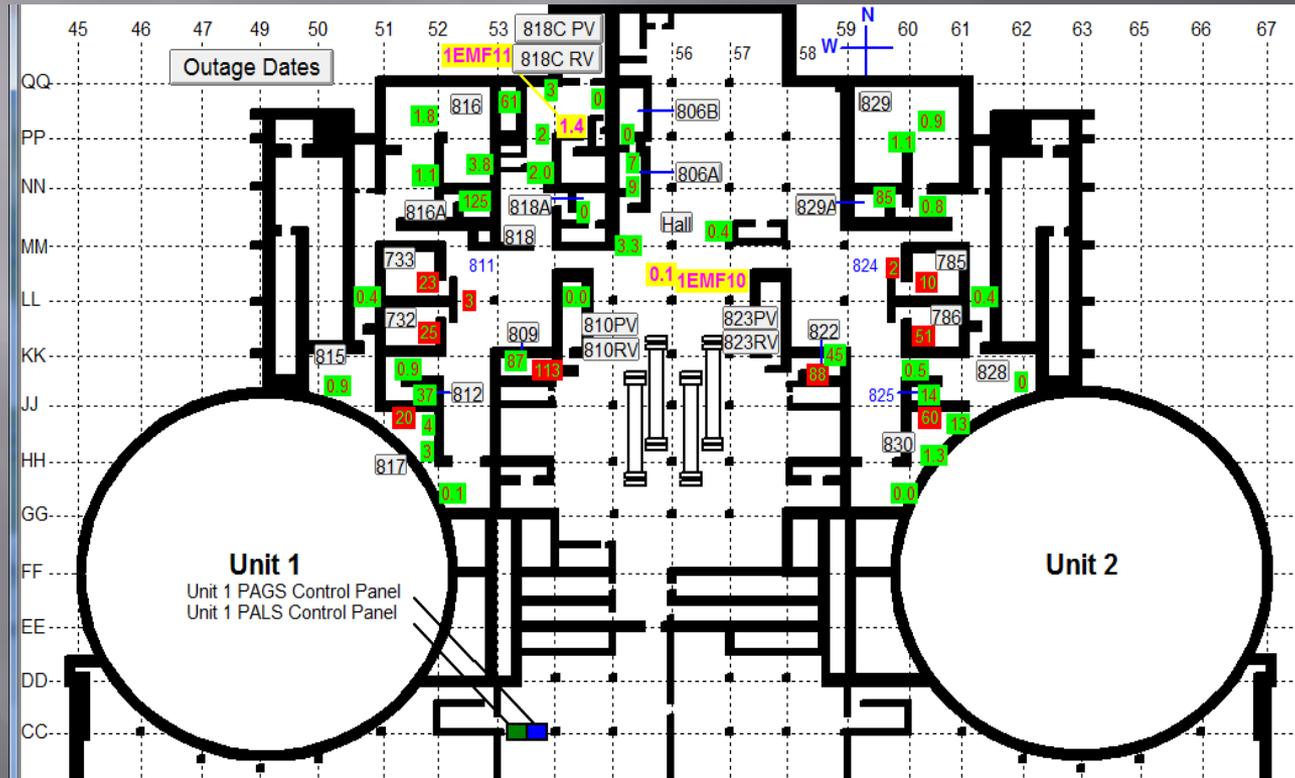
# Rad Info Old Process

- ▣ Old Process, (been doing it for years):
  - Info from past survey in book, drawer, or file
  - IF work was planned, you could check work request for info, if anything was documented.
  - Remember planning comment



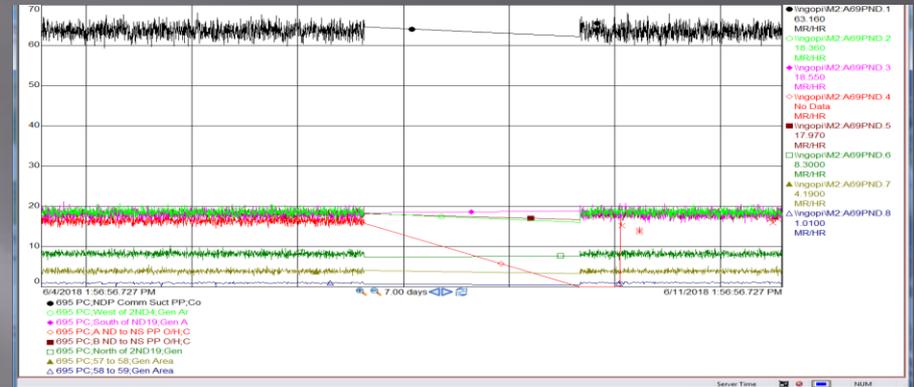
# Rad Info Old Process

- Initiate DRMS for approximately 244 ARM's
- During outage another 100 ARM's



# Rad Info Old Process

- DRMS has graphing capabilities.



- Look through approx. 1300 photo of room and/or component for ALARA . Information is 30 yrs old and identifying these documents is extremely hard.

# Communicating Information

- ▣ So how are we communicating information to the worker:
  - DRMS displays dose rates on maps, if you know what to click on.
  - Room Surveys were available, but hard to obtain
  - Multiple process's existed to obtain info not consistent.

# Communicating Information



# What's our Target?

- ▣ Reducing accumulated dose in this small target area is tough.
- ▣ How do you increase worker knowledge of low dose fields during short duration entries?
- ▣ Increasing worker knowledge is our best tool.

# What else can you do?

- ▣ Reducing dose with small potential requires worker knowledge of the dose.
- ▣ RP's expected to inform workers of dose rates.
- ▣ RP has more stringent requirement for reducing exposure.

Year	INPO Ratings	BEST
2003	3 yr Avg/Unit	72 R/Unit
2009	18 month/12 month/Unit	39.3 R/Unit
2015	18 month/12 month/Unit	26.7 R/Unit

# Tools

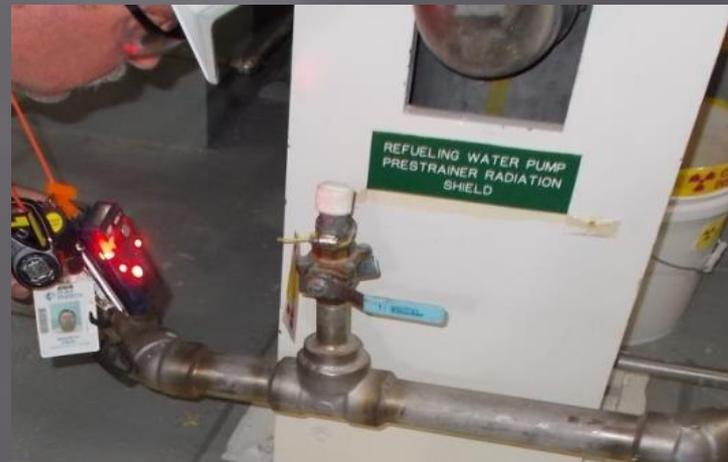
- ▣ Informing workers of dose rates
  - Send a RP tech with all work groups
  - Make worker accountable for their dose-Recent information (now vs past).
  - Multiple updating plan views identifying source
  - RP's can monitor multiple locations with no means to communicate to workers.
  - Reducing dose rate on Electronic dosimeter to keep worker awareness

So, what's the problem with these process's?

# Tools

- ▣ Informing workers of dose rates
  - Send a RP tech with all work groups
  - Make worker accountable for their dose-Recent information (now vs past).
  - Multiple updating plan views identifying source
  - RP's can monitor multiple locations with no means to communicate to workers.
  - Reducing dose rate on Electronic dosimeter to keep worker awareness. **Worker provided information could result in !!!**

**DOSE RATE ALARMS**  
Another area RP is  
responsible for.



# Check list

- The following information needs to be communicated to RP in order for RP to determine radiological instructions:
  - Detailed description of work scope including job duration
  - Exact work location including overhead access if necessary
  - Exact travel path
  - Need to breach contaminated system
  - Potential to encounter any wet conditions
  - Applicable Work Order information including RWP, dose estimate and WOTA requirements
  - Need to remove material from contaminated area
  
- The following radiological instructions associated with work activity needs to be communicated to each Radworker by RP:
  - All Trip Ticket radiological information
  - Dress requirements
  - Specific radiological work instructions
  - If applicable, Anticipated Dose Rate Alarm including allowance for two alarms in work area
  - Exit area immediately and notify RP if any of the following occur:
    - Torn/sweat soaked/wet protective clothing
    - Unexpected dose rate alarm
    - Dose alarm
    - Work scope changes
    - 3rd anticipated dose rate alarm in work area

# Tools

- ▣ Informing workers of dose rates
  - Appears the current process is to much technology in to many areas.
  - Combining technology has been cumbersome
  - Entertaining and understandable
  - Just need the right people with a process

# Tools

**A JOB INTERVIEW**



**WITH A MILLENNIAL**

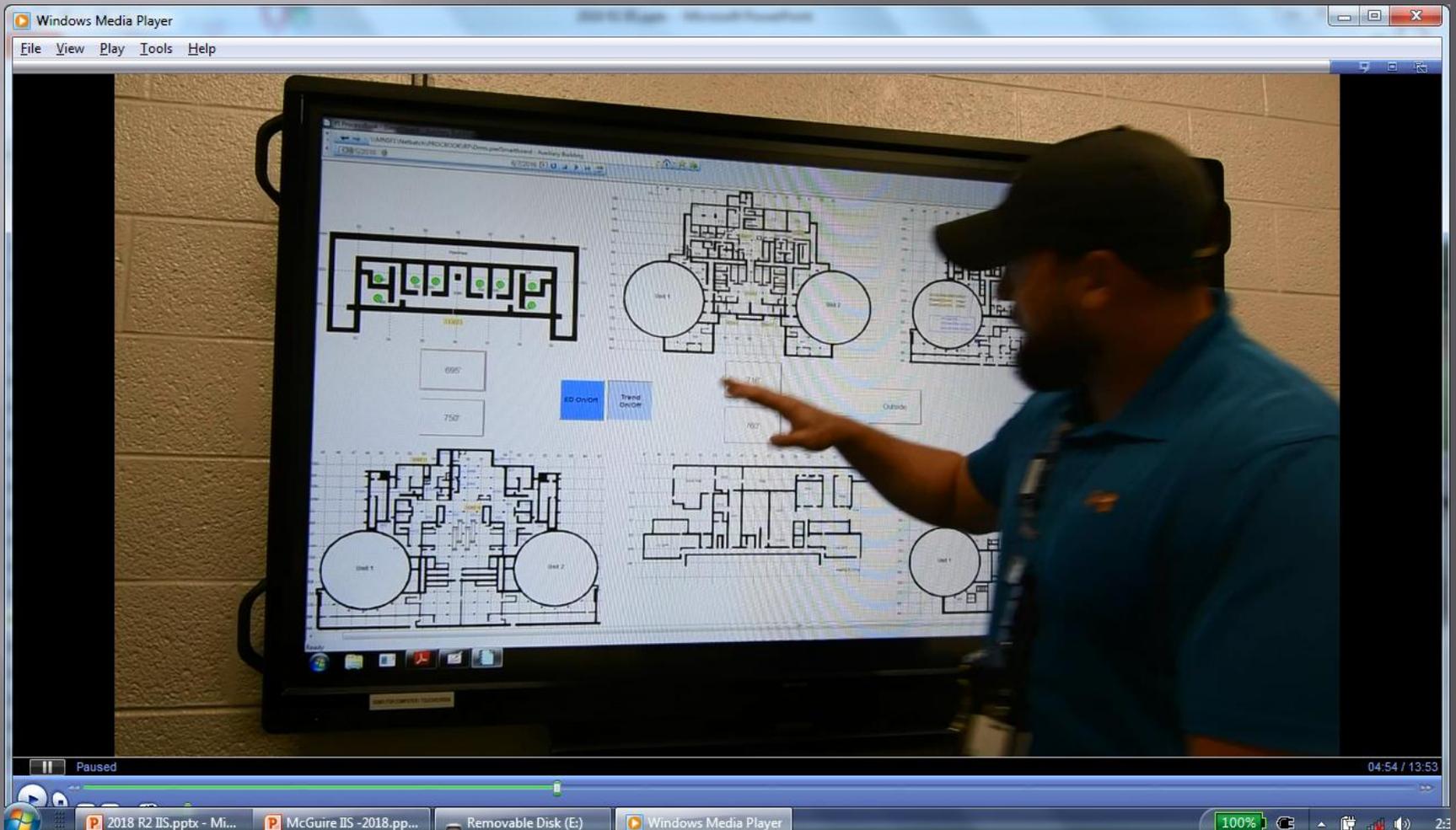
**NOW I'VE SEEN EVERYTHING**

# Tools

- ▣ WAM500
  - Identify dose rates to workers continually
  - Identify unexpected conditions
  - Identify changing conditions with flashing lights and color



# RP Duty Desk



# DRMS Aux Bldg. Summary Screen

6/4/2018 10:00:2017 \\mnsfs\Programs\NetBatch\PROCBOOK\RP\Drms.piv\Aux Building Alarm Summary Screen

**695' Data Sheets**

Unit-1			Unit-2			Shared		
Room	mrem/hr	Link	Room	mrem/hr	Link	Room	mrem/hr	Link
500	0	<input type="checkbox"/>	504	0.3	<input type="checkbox"/>	Hallway	0.3	<input type="checkbox"/>
	2	<input type="checkbox"/>	505	0.5	<input type="checkbox"/>		0.0	<input type="checkbox"/>
	3	<input type="checkbox"/>		12	<input type="checkbox"/>	Unit-1 Pipe Chase	0.0	<input type="checkbox"/>
501	15	<input type="checkbox"/>	506	3	<input type="checkbox"/>		43	<input type="checkbox"/>
	4	<input type="checkbox"/>		2	<input type="checkbox"/>		20	<input type="checkbox"/>
502	0.1	<input type="checkbox"/>	507	4	<input type="checkbox"/>		0	<input type="checkbox"/>
503	0.2	<input type="checkbox"/>		2	<input type="checkbox"/>	21	<input type="checkbox"/>	
						22	<input type="checkbox"/>	
						8	<input type="checkbox"/>	
						3	<input type="checkbox"/>	
						3	<input type="checkbox"/>	
						2	<input type="checkbox"/>	
						65	<input type="checkbox"/>	
						19	<input type="checkbox"/>	
						18	<input type="checkbox"/>	
						17	<input type="checkbox"/>	
						20	<input type="checkbox"/>	
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						508A	0.1 <input type="checkbox"/>	

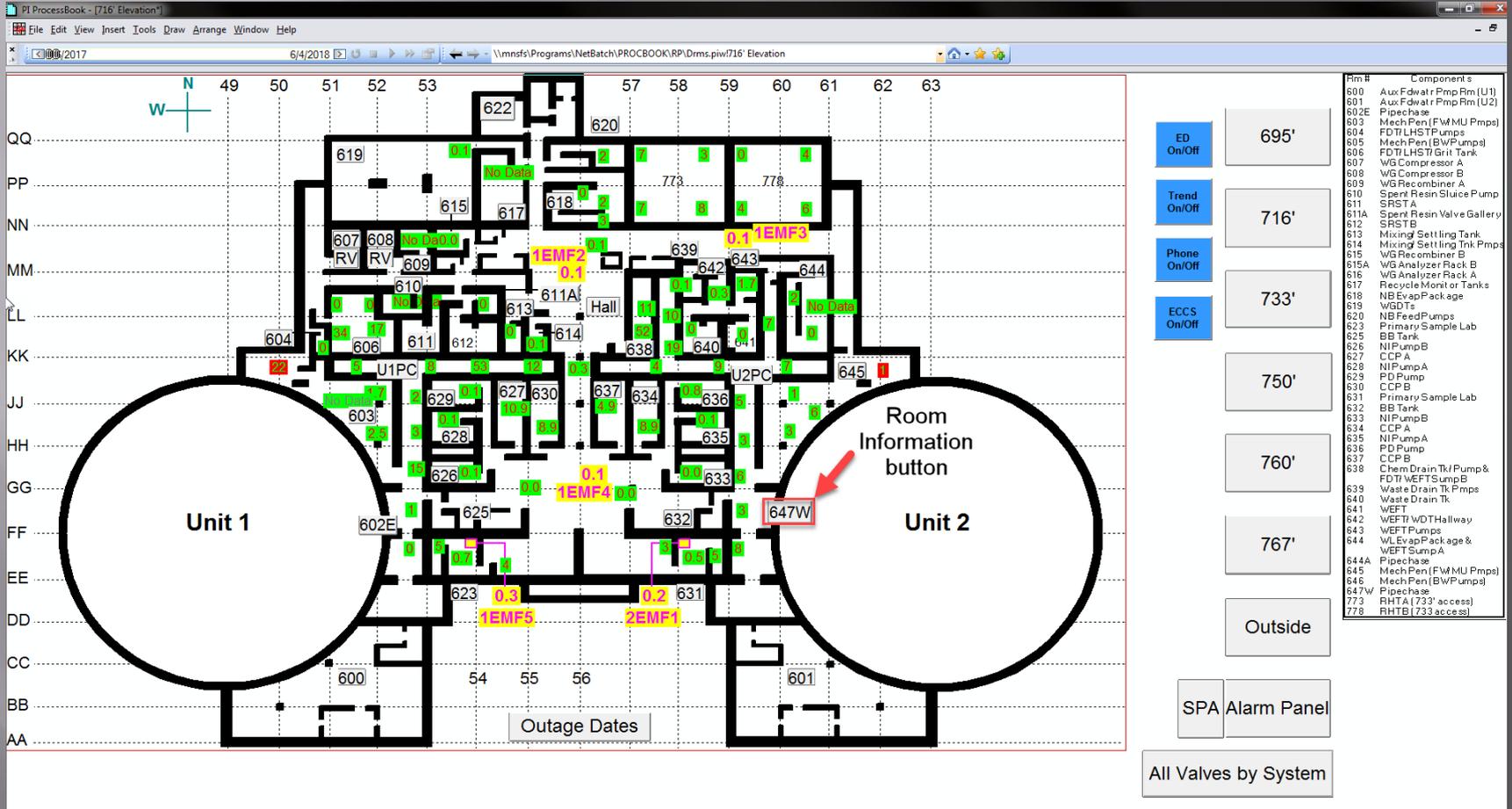
**716' Data Sheets**

Unit-1			Unit-2			Shared		
Room	mrem/hr	Link	Room	mrem/hr	Link	Room	mrem/hr	Link
602E	2	<input type="checkbox"/>	631	5	<input type="checkbox"/>	Unit-1 Pipe Chase	6	<input type="checkbox"/>
	0	<input type="checkbox"/>	634	8.9	<input type="checkbox"/>		8	<input type="checkbox"/>
	8	<input type="checkbox"/>	633	0.1	<input type="checkbox"/>	55	<input type="checkbox"/>	
	1.0	<input type="checkbox"/>	636	0.7	<input type="checkbox"/>	13	<input type="checkbox"/>	
	0.3	<input type="checkbox"/>	635	0.2	<input type="checkbox"/>	2	<input type="checkbox"/>	
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	2.2	<input type="checkbox"/>	637	5.4	<input type="checkbox"/>	15	<input type="checkbox"/>	
	No Data	<input type="checkbox"/>	645/	1.3	<input type="checkbox"/>	30	<input type="checkbox"/>	
	6	<input type="checkbox"/>	646	5.5	<input type="checkbox"/>	9	<input type="checkbox"/>	
	0.7	<input type="checkbox"/>		3.0	<input type="checkbox"/>	13	<input type="checkbox"/>	
	3	<input type="checkbox"/>		3	<input type="checkbox"/>	53	<input type="checkbox"/>	
	23	<input type="checkbox"/>		3	<input type="checkbox"/>	34	<input type="checkbox"/>	
	6	<input type="checkbox"/>		9	<input type="checkbox"/>	3	<input type="checkbox"/>	
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# DRMS for Resin Sluice



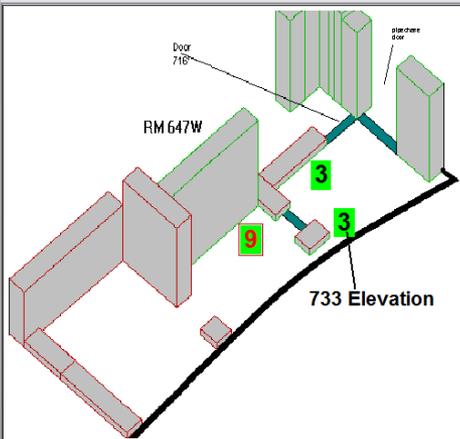
# Elevation View



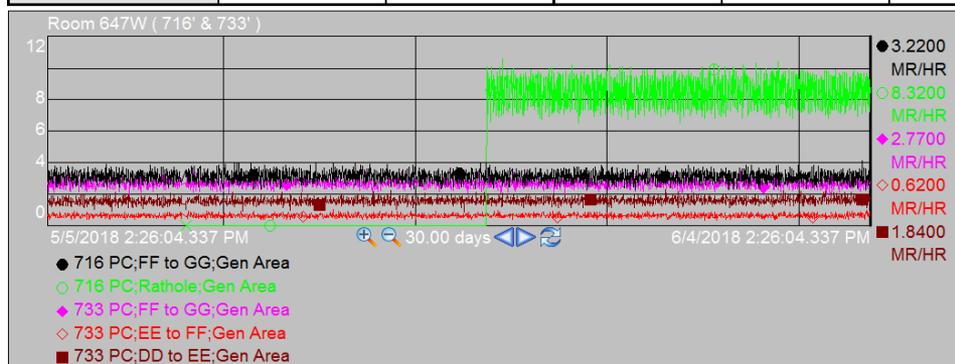
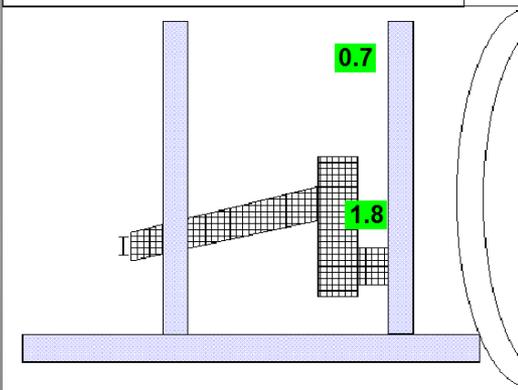
# Room Information

## Room 647W

To Elevation	To Alarm Panel	View Most Recent Survey	Valves
Room View		View Most Recent Survey	



All Dose Rates in mrem/hr					
PI Tag Name	M2A71PNA1	M2A71PNA2	M2A73PNA1	M2A73PNA2	M2A73PNA3
Location	FF to GG; Gen Area	Rathole; Gen Area	FF to GG; Gen Area	EE to FF; Gen Area	DD to EE; Gen Area
Expected Dose Rates Ranges	0.5 - 5	1 - 7	0.5 - 6	0.5 - 5	1 - 10
Actual Dose Rates	3	9	3	0.7	1.8



# 360 Tour



# VSDS Web Viewer

The screenshot displays the VSDS Web Viewer interface. The main window shows a 3D perspective view of Room 647W. A north arrow is located in the upper left. A yellow box labeled "You Are Here" is positioned near a yellow box labeled "RA CA RPBPRFE". A thick black line indicates the "Minimum posting: Radiation Area".

Labels in the 3D view include:

- Door 716"
- RM 647W
- 15-25
- 0.1, 0.2, 0.3, 1-2, 4, 5
- \*70 +8
- \*200 +30
- \*780 +70
- \*192 +23
- \*50 +10
- \*750 +70
- 25-40
- 2NM0008
- DRMS
- LDWA
- in overhead Near 2NM0028

On the right side, there is a vertical list of items:

- Valves
- A73PNA3
- D to EE; en Area
- 10
- 1.7

At the bottom of the 3D view, a yellow box contains the text: "Minimum posting: Radiation Area".