



TOOLS TO REDUCE COMMON DEFICIENCIES

**PRESENTED BY:
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TOP 5 SAN JOAQUIN COUNTY DEFICIENCIES

- Documenting routine activities (daily rounds, maintenance, etc.)
- Conducting / documenting annual maintenance inspections
- Following up and resolving recommendations / corrective actions from various reports in allotted time
 - PHA, Compliance Audit, MIA
- Training
- Coordinating your facility's emergency response w/ local agencies



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WHAT IAR BULLETIN 110 SAYS ABOUT FREQUENCY

- Preferably every four hours, but at least daily
 - Observed in normal operation and a full log taken of operating conditions
- Compared with seasonal design conditions
- Compared with the safe limits of operation



WHAT IIR 6 SAYS ABOUT FREQUENCY

TABLE 5.2
Frequencies

Period	Calendar Basis	Runtime Basis (hours)
Daily	Occurring once per 24 hours.	24
Weekly	Occurring once per calendar week.	168
Monthly	Occurring once per calendar month.	730
Quarterly	Occurring four times per year. The minimum period between ITM tasks is 2 months. The maximum is 4 months.	2,190
Semiannual	Occurring twice per 12 consecutive months. The minimum period between ITM tasks is 4 months. The maximum is 8 months.	4,380
Annual	Occurring once per year. The minimum period between ITM tasks is 9 months. The maximum is 15 months.	8,760
Biennial (Two Years)	Occurring once every other year. The minimum period between ITM tasks is 21 months. The maximum is 27 months.	17,520
Three Years	Occurring once every 36 months. The minimum period between ITM tasks is 30 months. The maximum is 42 months.	26,280
Five Years	Occurring once every 60 months. The minimum period between ITM tasks is 54 months. The maximum is 66 months.	43,800
Ten Years	Occurring once every 120 months. The minimum period between ITM tasks is 108 months. The maximum is 132 months.	87,600

What if no one is here 24/7?

WHAT IAR 6 SAYS ABOUT COVERAGE

- When personnel are not scheduled during weekends, holidays, and/or during harvesting off seasons, daily inspections are not required
- Inspections shall resume during the next shift when a trained operator / technician is back on duty





WHY DO I NEED TO DO DAILY ROUNDS?

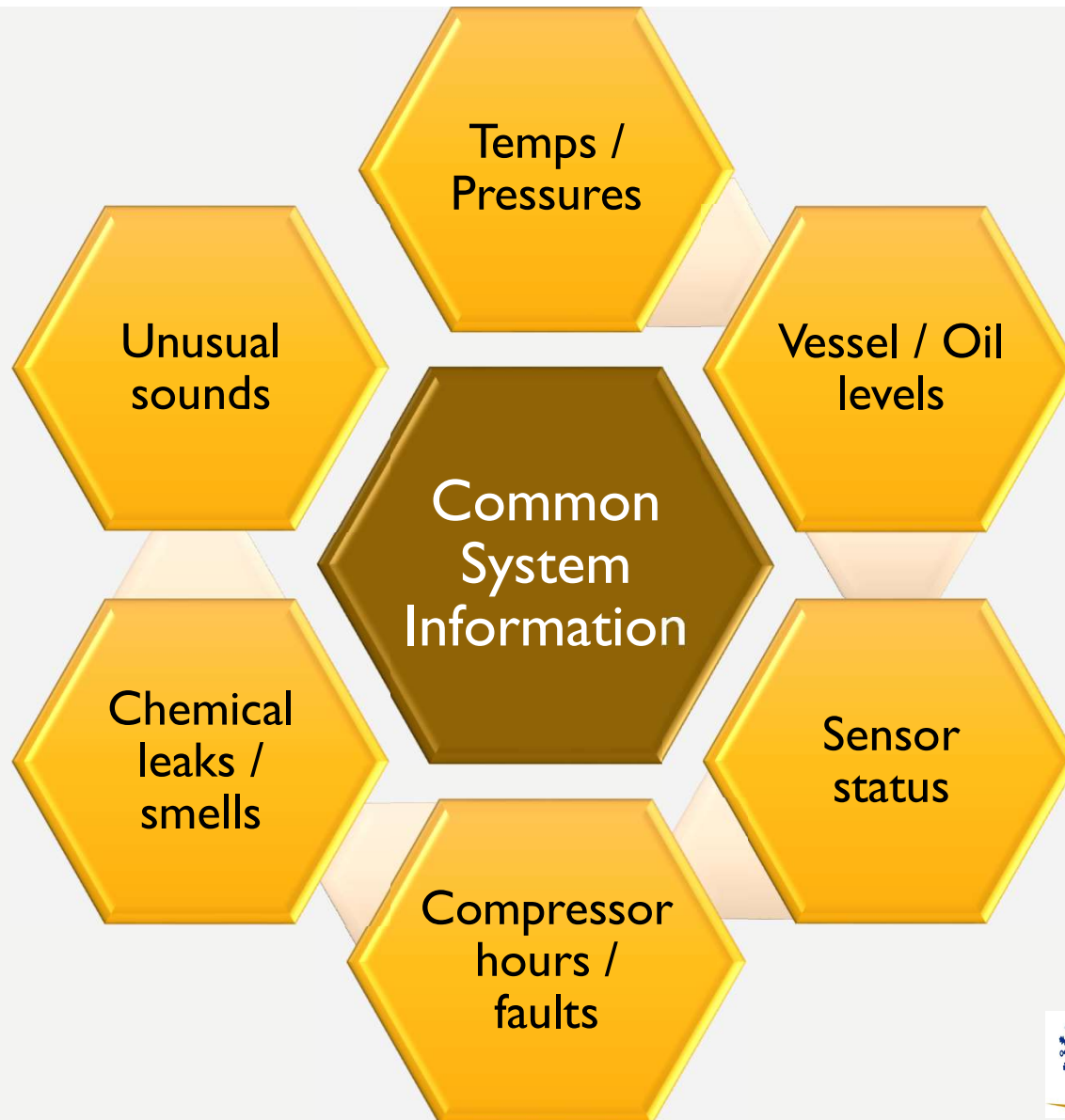
**WHAT INFORMATION IS PERTINENT
ON DAILY ROUNDS?**

WHAT IAR 6 SAYS ABOUT SYSTEM RECORDS

Means of record keeping such as a log to:

- Document and transfer pertinent operational, maintenance, and ongoing duty information between shifts
 - Equipment ITM tasks at hand
 - Nuisance reports or details on leaks, intermittent issues
 - Incident and investigations
 - Round reports
 - Forthcoming tasks
 - SWP





TIPS ON DEVELOPING YOUR DAILY ROUND SHEET

- Identify equipment that requires monitoring
- List operating parameters
 - Should match PSI
- Comments / notes / corrective action section
- Create procedure for completing the form and rounds
 - How often rounds are required
 - Include visual inspections to be carried out
 - Procedure for deficiencies found
- May include oil log





SAMPLE DAILY ROUND SHEET

IIAR BULLETIN 110 SAMPLE

APPENDIX I - SAMPLE SYSTEM LOG

COMPRESSOR NO.

Date	Time	Suction			Discharge			Oil			Motor Amps	Hours Run	Remarks/ Maintenance Signature
		Pressure PSI	Sat. Temp °F	Gas Temp °F	Pressure PSI	Sat. Temp °F	Gas Temp °F	Pressure PSI	Level	Amount Added			



IIAR BULLETIN 110 SAMPLE

SYSTEM LOG (CHILLED WATER SYSTEM)

Date	Time	Chilled Water			Evaporator		Condenser	Receiver		Oil Drained		Refrigerant Added	Remarks/ Maintenance Signature
		To Process °F	From Process °F	Differential Pressure	Refrigerant Pressure	Liquid Level	Pressure PSI	Pressure PSI	Level	Evaporator	Receiver		



Sample Daily Round Sheet

	250hp	400hp	500hp	450hp	Operator
	SC-1	SC-2	SC-3	SC-4	Date _____ Time _____
Compressors					
Is unit online					Yes or No
Suction pressure					(2 HG to 3 PSIG OFF PEAK, (3 PSIG TO 8 PSIG ON)
Suction Temperature					0°F to 20°F
Discharge pressure					(100 PSIG LOW LOAD TO 150 PSIG HIGH LOAD)
Discharge Temperature					100°F to 185°F
Oil pressure					30-50 PSIG
Oil temperature					100°F to 155°F
Oil Filter Differential					0-15 PSIG
Slide valve position					Log % Loaded
Oil level					Bottom Sight glass full. Top 25% or less
Colescent Sight Glass					0% oil level
Motor current Amps					Log Amps
Compressor Hours					Log Hours
Unusual noise or vibration?					Yes or No
Oil, NH3 leaks					Yes or No
Log any Alarms					

Condensers

	EC-3	EC-4	EC-5	
Fans On				Yes or No
Pumps On				Yes or No
Belts Ok				Yes or No
PH 7 to 8.3				Log PH
TDS 1000-3500				Log TDS
Chemical Tank Level				Inches-Order Fill at 55 gals.

Vessels

HPR Level

Low level Float Satisfied 16" to 30"
 Yes or No

Subcooler Satisfied or calling

Subcooler Low Level Satisfied Yes or No

LPR-1 Level Satisfied or calling

Low Level Float Satisfied Yes or No

Ammonia Pump Discharge PSI (25-45 PSIG) over suction

Oil Indicator Rod Position AP-2 .5 to 3" out. Fill at 3"

LPR-2 Level Satisfied or calling

Low Level Float Satisfied Yes or No

Ammonia Pump Discharge PSI 3 (25-45 PSIG) over suction

Ammonia Pump Discharge PSI 4 (25-45 PSIG) over suction

Oil Indicator Rod Position AP-3 .5 to 3" out. Fill at 3"

Oil Indicator Rod Position AP-4 .5 to 3" out. Fill at 3"

Oil Indicator Rod Position STBY .5 to 3" out. Fill at 3"

LPR-3 Level Satisfied or calling

Low Level Float Satisfied Yes or No

Ammonia Pump Discharge PSI (25-45 PSIG) over suction

Oil Indicator Rod Position AP-6 .5 to 3" out. Fill at 3"

Ammonia Sensors

Room	PPM	Room	PPM
Room 1	<input type="checkbox"/>	Room 1	<input type="checkbox"/> °F Avg
Room 2	<input type="checkbox"/>	Room 2	<input type="checkbox"/> °F Avg
Room 3	<input type="checkbox"/>	Room 3	<input type="checkbox"/> °F
Room 4	<input type="checkbox"/>	Room 4	<input type="checkbox"/> °F
Room 5	<input type="checkbox"/>	Room 5	<input type="checkbox"/> °F Avg
NCP-1	<input type="checkbox"/>	NCP-1	<input type="checkbox"/> °F
NCP-2	<input type="checkbox"/>	NCP-2	<input type="checkbox"/> °F
LPR-3	<input type="checkbox"/>		
ER	<input type="checkbox"/>		


Room Temperature

	Rm-1	Rm-2
Underfloor Heat Fans ok	<input type="checkbox"/>	<input type="checkbox"/>
Underfloor Glycol Level	<input type="checkbox"/>	<input type="checkbox"/> Inches
Glycol Supply Temp	<input type="checkbox"/>	
Glycol Return Temp	<input type="checkbox"/>	
Purger Count	<input type="checkbox"/>	
Weekly Diffusion Tank PH	<input type="checkbox"/>	7.0 to 7.5
Oil Added:	<input type="checkbox"/> Qts.	<input type="checkbox"/> Gals.
Oil Removed	<input type="checkbox"/> Qts.	<input type="checkbox"/> Gals.
Added to:	<input type="checkbox"/>	
Net year to date:	<input type="checkbox"/>	

Comments:



Compressor Log - RC01

		Monday		Tuesday		Wednesday		Thursday		Friday		Saturday	
Date													
Time													
Name or Initials													
	Normal	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual
Suction Pressure	33.5 psig												
Discharge Pressure	140 psig												
Oil Pressure	40-50 psig												
Suction Temperature	20-40° F												
Discharge Temperature	170° F												
Slide Valve Position	50 -100%												
Inlet Oil Temp.	130- 150° F												
Oil Sep Temp.	140- 160° F												
Oil Filter Differential	< 10												
Motor Amperage	300-400												
Oil Level in Top Sight Glass		0	0	0	0	0	0	0	0	0	0	0	0
Notes													



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MECHANICAL INTEGRITY REGULATION

- Inspection / testing procedures shall follow RAGAGEP
- Frequency shall be consistent manufacturers' recommendation and good engineering practices
- More frequently if determined by prior operating experience



TIPS FOR ANNUAL INSPECTIONS

- Review manufacturer's OEM
 - Best schedule to follow
- Determine the standard that the facility will follow
 - IIAR Bulletin 110 or IIAR 6 (Ammonia), or another standard for your covered process
- Create a maintenance schedule (frequency) from OEM, IIAR, and/or a mix of the two
 - Good idea to use CMMS, tickler in file, etc.
- Create inspection sheets to capture the information
- Ensure to follow document retention times



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SJCEH TIMEFRAMES FOR RECOMMENDATIONS

- PHA = 1-year
 - Request extension in writing; include the reason(s)
 - May extend to 2.5 years
- Mechanical Integrity (MIA) = Depends but <5 years
 - Title 19 – “...shall correct deficiencies in equipment that are outside acceptable limits (defined by the PSI in 2760.1), before further use or in a safe manner when necessary means are taken to assure safe operation”
 - Evaluate severity / hazards associated



SJCEH TIMEFRAMES FOR RECOMMENDATIONS

- Mechanical Integrity (MIA) = Depends but <5 years
 - IIAR 6 – Owner shall designate an individual to ensure a timely evaluation is arranged to determine appropriate corrective action(s) and the time frame
 - Explanatory – May include a ranking method to determine the severity and likelihood of what could result if the deficiency is not resolved and to determine a time frame
- Compliance Audit = 1-year
 - Request extension in writing; include the reason(s)



TIPS TO SETTING UP RECOMMENDATION TRACKING

- Develop a system that works for you and your team
 - Monthly meetings to review / update status
 - Utilize your CMMS for all recommendations
- Move all recommendations onto one main tracking log
- Assign responsibility
 - No responsibility leads to everybody, somebody, anybody, and nobody
- Assign an estimated completion date immediately
- List actual completion date



EVERYBODY, SOMEBODY, ANYBODY, AND NOBODY



This is a little story about four people named Everybody, Somebody, Anybody, and Nobody. There was an important job to be done and Everybody was sure that Somebody would do it. Anybody could have done it, but Nobody did it. Somebody got angry about that because it was Everybody's job. Everybody thought that Anybody could do it, but Nobody realized that Everybody wouldn't do it. It ended up that Everybody blamed Somebody when Nobody did what Anybody could have done



TIPS TO SET UP RECOMMENDATION TRACKING

- Identify corrective actions taken
 - Before / After pictures
 - List document locations (revised and/or new)
- Indicate if communication is a requirement (affected personnel)
 - PHA
 - Incident investigations

Helpful tip: The quicker you can access the recommendations, report the status, share your schedule of completion, show pictures, etc. helps gain confidence with the regulator



PSM / RMP / Cal/ARP Action Register

#	Date Initiated	Document / Element Reference	Proposed Action / Description of Change from Action	Priority Rank	Assigned to	Expected change date	Revised change date	Date Completed	General Info/ Work Order #	Supporting Documentation (If applicable)
<p align="center">Legend for Priority Ranking: A = Immediate action required; B = Action required at first opportunity; C = Action required unless risk ALARP (as low as reasonably practicable); C* = Potential code deficiency that is not a pre-existing non-conformity</p>										
1										
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3										
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	Audit Type	Date of Audit	Target Completion Date	Assigned To	Effected CalARP Section	Description	Status/Update	Completion Verified By	Date Completed	Location of Revised Docs, pictures, etc.
1	Hazard Review	7/28/2014	2/27/2014	John	PSI	Update valve list, tag critical valves	Valve schedule has been updated, copy enclosed, approx. 25 valves need to be tagged.	Vanessa	11/17/2014	Attached to report
2	Hazard Review	7/28/2014	6/30/2015	John	MI	Continue ongoing insulation upgrade.	I have contacted insulator to provide quote and scheduling.	Steve	6/30/2015	Pictures attached to report
3	Hazard Review	7/28/2014	1/30/2015	John	General	Recommend adding additional signage to engine room doors	Purchasing to order NFPA sign for engine room door	Steve	1/30/2015	
4	Hazard Review	7/28/2014	12/15/2014	John	EAP	Contact MID and share system information, Company to update program	Contacted Chris Tuggle (MID Generation Supervisor) by phone and sent email requesting ammonia basic system information. I provided Chris with our system information along with emergency contact information. Copy of email enclosed.	Steve	12/24/2014	Email attached
5	Hazard Review	7/28/2014	12/17/2014	John	MI	Increase inspection to monthly and document	Create MP2 work order for monthly inspections of cartridge respirators. Copy of new w/o for cartridge respirators enclosed. BW gas detector w/o has been ongoing and a completed copy enclosed.	Vanessa	1/15/2015	See MP2 work order attached
6	Hazard Review	7/28/2014	5/8/2015	John	EAP	Recommend a coordinated drill with the fire department and if possible the Hazmat team	Called Ripon Fire Dep. And left a message for Dennis Bitters in regards to drill and responding to confined spaced rescue. Contacted Marty Cornilsen RFD Battalion Chief to schedule training exercise; Contacted Marty Cornilsen (RFD) Battalion Chief. Scheduled training session with three fire crews (AB&C shifts) Completed	Vanessa	5/29/2015	

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WHAT IS REQUIRED?

Initial Training

- Employees who are presently involved in operating a process, and before being involved in a newly assigned process shall be trained in:
 - Overview of process
 - Operating procedures
 - Emphasis on the safety / health hazards
 - Emergency operations, including shut down
 - Safe work practices applicable to assigned job task(s)



WHAT IS REQUIRED?

Refresher Training

- Every 3-years, and more often as necessary
 - Each employee involved in operating a process to assure that the employee understands and adheres to current SOP
 - *In consultation with the employees shall determine the appropriate frequency
 - Two-way dialog between employer and employee



WHAT DO I DO FIRST?

- Ask yourself, what employees can affect our covered process? And to what degree
 - Forklift driver can accidentally hit pipes or air units in the freezer = Train on location of piping and the consequences of hitting the pipe(s) and/or equipment
 - Employee who just performs system rounds = Train on the purpose of rounds, how to complete the log, what to look for, and procedure for reporting deviations
 - Operator who starts /stops equipment, occasionally drains oil = Training on every procedure they would carry out, basic refrigeration, etc.



WHAT DO I DO FIRST?

- Decide the levels of operators and categorize them
 - Entry level, Technician I, II, III, Operator, Engineer
- Determine what set of responsibilities each level must master to meet their current responsibilities and how to progress from one level to another
 - Entry level – Clear alarms, restart equipment after power failure
 - Technician level – All of entry level tasks and any SOP that they have been trained on
 - Technician II, III – All of the above and able to open the system to perform maintenance, modify system parameters, write temporary SOP



WHERE / WHEN IS IT DONE?

- Training can take place in the workplace and classroom
- Completed before a worker is allowed to work independently in a specific task
- Refresher training is provided thereafter
- Performance assurance system then tests the trained workers to demonstrate they possess the required knowledge, skills, and ability



TIPS ON HOW TO CAPTURE TRAINING

- Ensure to capture all the OTJ training
- Utilize a form with all the required sections
 - Name, SOP or task covered, competency method, certification to carry out tasks
- Identify the tasks that will be performed
 - Determine the knowledge, skills, and ability for personnel who will be assigned to carry out the tasks



SAMPLE TRAINING FORM

Operator Training Record

Facility: Date:

Training Certification

Operator Name:

KEY		
Means Used to Verify	Abbreviation	Verification confirms that:
OBSERVATION	OB	I have watched this operator correctly perform the procedures.
DEMONSTRATION	D	This operator has physically demonstrated that he/she can perform the procedures.
ORAL TESTING	OT	I have questioned this operator extensively until I was sure that he/she understood the procedures.
WRITTEN TESTING	WT	I have given this operator a written test(s) to ensure that he/she understood the procedures (attach completed tests).
VERIFICATION	V	I have inspected this operator's work to ensure it meets job specifications.
THIRD PARTY VERIFICATION	TPV	A third-party (trainer, engineer, corporate engineer, contract engineer) has administered testing to ensure that this operator understood the procedures (attach written test, or certification of oral testing, or certification of demonstration).

Subject	Date of Training	Trainer Name	Means Used to Verify (use abbreviation)
Safety & Health Hazards			
SDS location	<input type="text"/>	<input type="text"/>	<input type="text"/>
SDS information/properties of ammonia	<input type="text"/>	<input type="text"/>	<input type="text"/>
Safety and health hazards presented by ammonia	<input type="text"/>	<input type="text"/>	<input type="text"/>
Precautions necessary to prevent exposure			
Engineering controls - system integrity, spring-loaded drain valves, etc.	<input type="text"/>	<input type="text"/>	<input type="text"/>
Administrative controls - basic safe work practices	<input type="text"/>	<input type="text"/>	<input type="text"/>
PPE - where/when PPE is required	<input type="text"/>	<input type="text"/>	<input type="text"/>
PPE - donning/use/maintenance of full-face respirators	<input type="text"/>	<input type="text"/>	<input type="text"/>
Control measure to be taken if exposure occurs			
First aid procedures for contact and airborne exposure	<input type="text"/>	<input type="text"/>	<input type="text"/>
Locations and use of safety eyewash/showers	<input type="text"/>	<input type="text"/>	<input type="text"/>
Special or unique hazards			
Do not isolate without room for expansion	<input type="text"/>	<input type="text"/>	<input type="text"/>
Attraction to water/moisture	<input type="text"/>	<input type="text"/>	<input type="text"/>
Safe Work Practices			
Using sulfur sticks	<input type="text"/>	<input type="text"/>	<input type="text"/>



SAMPLE TRAINING FORM

AMMONIA REFRIGERATION TRAINING

Trainee's Name: _____ Date of Hire: _____

Confirmation of Understanding

Description of Topics Covered	Confirmation of Understanding	Date of Training	TRAINEE'S Initials	TRAINER'S Signature
Ammonia Detection System Testing	OJT - Observation & questioning			
Ammonia sensor Calibration	OJT - Observation & questioning			
Operation of Refrigeration Computer	OJT - Observation & questioning			
Daily Engine Room Log Sheet - Taking Readings	OJT - Observation & questioning			
Preventive Maintenance for Condensers	OJT - Observation & questioning			
Preventive Maintenance for Evaporators	OJT - Observation & questioning			
Preventive Maintenance for Compressors	OJT - Observation & questioning			
Preventive Maintenance for Ammonia Pumps	OJT - Observation & questioning			
Preventive Maintenance for Pressure Relief Valves	OJT - Observation & questioning			
Preventive Maintenance for Exhaust Fans	OJT - Observation & questioning			
Preventive Maintenance for Emergency Exhaust Fans	OJT - Observation & questioning			



SAMPLE OTJ TRAINING FORM

On the Job Training Record

Date: _____

Employee Name: _____ Employee #: _____

Equipment Trained On: _____

Describe the procedure(s) employee demonstrated:

Total time for on the job training / hands-on field work completed: _____

Employee demonstrated procedure(s): () Successfully () Unsuccessfully () Additional Training Required

If employee was unsuccessful, please describe what was done incorrectly and steps to prepare employee for a re-test:

The above named employee has received prior training and has successfully demonstrated the above procedure.

Trainer's Name

Trainer's Signature



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**WHY DO I NEED
TO COORDINATE
WITH RESPONSE
AGENCIES?**

EPA'S RATIONAL FOR EMERGENCY COORDINATION

RETAINED/MODIFIED	RATIONALE
Enhanced Local Emergency Coordination Requirements	
<p>Retained the requirement that facilities must coordinate annually with local response organizations and document coordination activities</p>	<ul style="list-style-type: none"> • Worked well. • Good coordination between facilities and local responders is critical to reducing the impact(s) of incidents. • Compliance date: March 14, 2018 (Court mandate made this effective as of September 21, 2018)



EPA'S RATIONAL FOR EMERGENCY COORDINATION

Emergency Exercise Provisions

Retained annual notification drills

- EPA views these drills as important to confirm that emergency contact information is accurate and up to date.

Compliance date:

- Old: March 15, 2021
- New: Perform first notification exercise by five years after date of FR publication.



COMPLIANCE DATES [ASSUMING DECEMBER 2019 FINAL RULE EFFECTIVE DATE]

What	Due Date
Develop exercise plans and schedules	December 19, 2023
Conduct first notification drill	December 19, 2024
*Conduct first tabletop exercise	December 2026
*Conduct first field exercise	According to the exercise schedule established by the owner / operator in coordination with local response agencies



TIPS FOR COORDINATING W/ LOCAL AGENCIES

- Request coordination well in advance
- Request in email for documentation
- Topics to discuss:
 - Each other's expectations when a call is made
 - Pre-plan a meeting place
 - Tools you may have i.e. hand-held meter, facility map, fan, tarp, etc.
 - Will they perform rescue operations?; consider documenting on a mutual agreement form



Public Safety Teaming Agreement Worksheet

Operational Objectives: "PR" for Primary Responsibility and "S" for Support		PLANT PR or S?	FIRE PR or S?	LAW PR or S?	AMB. PR or S?
Emergency Response Objectives					
Safety officer: Set-up and secure the Isolation Zone, oversee safety on the emergency scene to include hazmat control zones and personnel accountability					
Rescue: Perform rapid-entry rescue of trapped/injured persons					
Method of Triage as per County or regional Emergency Medical Services					
Medical support:					
<input type="checkbox"/> Advanced Life Support	1.				
<input type="checkbox"/> Basic Life Support	2.				
<input type="checkbox"/> Medical monitoring and rehab support	3.				
<input type="checkbox"/> Transport to Hospital with Acute Care and/or Burn Treatment	4.				
Decontaminate emergency response personnel and injured victims:					
<input type="checkbox"/> Use on-site decontamination	5.				
<input type="checkbox"/> Provide a mobile decon unit	6.				
Communications support:					
<input type="checkbox"/> Coordinate radio communications	7.				
<input type="checkbox"/> Provide "cross-talk" radio communications connection between public/private responders	8.				

SAMPLE TEAMING AGREEMENT FORM



THANK YOU

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