

Annexure 3A

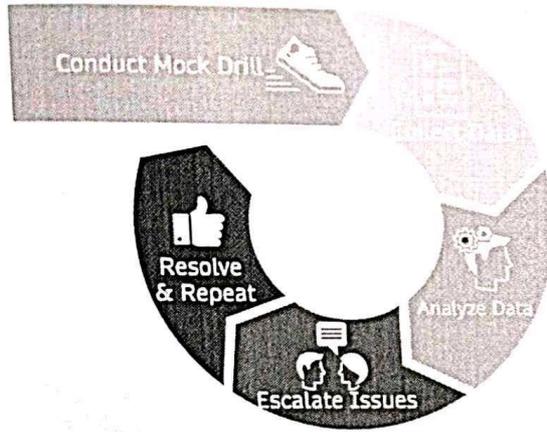
PSA Mock Drill IEC by MoHFW

Why Mock Drill?



- Ensure full functionality of all the PSA plants installed across State/UT
- Remain prepared during medical emergencies such as COVID-19 wave
- Enable timely issue resolution based on mock-drill output
- Acclimatize facility officers' with PSA day-to-day operations, issue handling and

Steps required in Mock Drill



Conduct Mock Drill

Conduct mock drills in all facilities with PSA plants, as per government guideline

Collect Data

Capture data in the Google Forms shared

Analyze Data

Analyze functionality across purity, pressure, flowrate of PSA plants in facilities

Escalate

Escalate issues to respective vendors/ implementing agencies/suppliers

Resolve & Repeat

Ensure timely resolution of all issues; Repeat the mock drills every 1-2 months

What do we aim to measure?

Functionality Check	<ul style="list-style-type: none"> • Run PSA at full capacity (maximum flow rate) from 9:00AM and take readings every 2 hour • Measure oxygen purity, pressure, flow rates at 11:00AM, 1:00PM and 3:00PM • Overall PSA machine runtime (in hours) 				
MGPS Check	<p style="text-align: center;">Check pipelines for leakages</p> <table border="1" style="width: 100%;"> <tr> <td style="width: 33%;">Between PSA and Manifold</td> <td style="width: 33%;">Between Manifold and Wards</td> <td style="width: 33%;">In the manifold</td> </tr> </table>	Between PSA and Manifold	Between Manifold and Wards	In the manifold	
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Electrical Supply Check	<p style="text-align: center;">Checks to ensure 24/7 electrical supply</p> <table border="1" style="width: 100%;"> <tr> <td style="width: 33%;">Availability of DG set</td> <td style="width: 33%;">Voltage fluctuation</td> <td style="width: 33%;">Wiring/connection faults</td> </tr> </table>	Availability of DG set	Voltage fluctuation	Wiring/connection faults	
Availability of DG set	Voltage fluctuation	Wiring/connection faults			
Technician Availability Check	<ul style="list-style-type: none"> • Check if at least 2 trained technicians are available on the site 24/7 • Specify the kind of training they received (10-hour, vendor, state training, etc.) and training modules from vendor 				
Fire Safety Check	<ul style="list-style-type: none"> • Check for appropriate safety measures as per IPHS/state health system guidelines • Relevant HR aware of fire safety measures 				

Best Practices for conducting a Mock Drill

- Run PSA at full capacity (maximum flow rate) and take readings every 2 hours
- Preferably use external O2 analyzer to check purity, and pressure gauge to measure pressure
 - At bed side, you can use ventilator to measure purity, pressure or flow
- Mock drill must be conducted for ALL plants, irrespective of whether they are working fine or not. If plant is operational, then simply measure the indicators and report on google form
- Ensure correct data is entered only in the google form shared by MoHFW and double check before submission
- In case multiple oxygen sources are present (LMO, cylinder, etc.), preferably switch-off other sources and take measurements at bed-side, if possible



How to solve PSA-related issues?



Problem/Fault	Possible Cause	Solution	Responsible Stakeholder
ON/OFF button does not illuminate/Plant does not cycle 	No electrical power	<ul style="list-style-type: none"> Check connection with main power supply Ensure DG set is installed for uninterrupted power 	PSA Operator
	Circuit Breaker has tripped	<ul style="list-style-type: none"> Reset circuit breaker 	PSA Operator
	PSA plant in standby mode	<ul style="list-style-type: none"> Plant will start again once the pressure goes down below the set point for standby mode 	PSA Operator
	ON/OFF switch bulb tripped	<ul style="list-style-type: none"> Replace light bulb 	Vendor
Low Operating Pressure 	Loose wiring / defective switch	<ul style="list-style-type: none"> Repair or replace 	Vendor
	Restriction in suction air intake filter	<ul style="list-style-type: none"> Check and replace filter elements 	Vendor
	Clogged pre-filter	<ul style="list-style-type: none"> Clean the air filters regularly and make sure Inlet feed air valve fully open and lines are clear 	PSA Operator
	Compressor output reduced	<ul style="list-style-type: none"> Corrective maintenance should be performed 	Vendor
High Operating Pressure	O2 demand > PSA capacity	<ul style="list-style-type: none"> Check oxygen usage Check Leakage in MGPS hose pipe 	PSA Operator
	Clogged muffler	<ul style="list-style-type: none"> Clean or replace the muffler as per manufacturer instruction manual 	Technician
	Contaminated sieve beds	<ul style="list-style-type: none"> Change the adsorbers material 	Vendor
	Purity Problem	Sensor problem (either ultrasonic sensor or electro-chemical sensor is defective)	<ul style="list-style-type: none"> Calibrate the sensor for environmental air @ 21% Ultrasonic sensor has a long life-span, typically no need for re-calibration. If defective, needs replacement For electro-chemical sensor, low shelf life (< 2yrs), after this needs replacement
Defective Oxygen analyzer		<ul style="list-style-type: none"> Repair or replace 	Vendor
Obstructed O2 sample flow line		<ul style="list-style-type: none"> Ensure that all valves on the oxygen sample line to oxygen analyzer are open 	PSA Operator
Inadequate inlet air		<ul style="list-style-type: none"> Check inlet air lines for obstructions. Adjust or replace the inlet air regulator 	PSA Operator
Leakage in internal pipeline		<ul style="list-style-type: none"> Check connecting pipe and valve for internal leakage 	PSA Operator
Dew point check on air Dryer		<ul style="list-style-type: none"> Check and set dew point set to 3 - 7 °C, if problem persists, needs repair 	Vendor
Clogged carbon activated pre-filter		<ul style="list-style-type: none"> Needs replacement 	Technician/ Vendor
Molecular sieve or zeolite		<ul style="list-style-type: none"> Replace adsorbing material 	Vendor
Dust particles in PSA output	Molecular sieve or zeolite	<ul style="list-style-type: none"> Replace adsorbing material 	Vendor
Compressor trips	Power supply fluctuations	<ul style="list-style-type: none"> Servo voltage stabilizer if required 	Vendor
Overheating of air compressor	Low voltage /low compressor oil due to leakage	<ul style="list-style-type: none"> Check mains power supply and Input voltage Fix the leakage and refill with oil 	Hospital/Vendor
PSA relief valve open	Pressure > max. pressure/ Defective relief valve	<ul style="list-style-type: none"> Adjust feed air regulator Replace the relief valve 	PSA Operator/ Vendor
Any hardware failure	Malfunction during plant operation	<ul style="list-style-type: none"> Vendor, per the contract, bound to provide corrective action/replacement within warranty 	Vendor
3rd Party lab testing report	Sample collection and report submission delay	<ul style="list-style-type: none"> Vendor collects O2 sample in presence of hospital authorities & submit the report to them OR Hospital takes the sample and sends it to an NABL approved labs on a regular basis. Must repeat this activity whenever any major part is replaced 	Vendor Hospital