

1. PURPOSE	:	The purpose of this procedure is to describe how mitigates the event of emergency such as utility interruptions, interruptions in the supply chain, labour shortages, critical technologies, key production equipment failure, field returns, information and communication technology.
2. SCOPE	:	This procedure is applicable to all the processes of the organisation
3. REFERENCE	:	ISO/TS 22163:2017 Clause No.: 6.1.4, IATF 16949:2016 Clause 6.1.2.3

4. PROCEDURE:

S. No.	Activity	Doc. Ref.	Responsibility
1.	Ensure restart of the Production within the stipulated time by using alternate options as per the time plan given in contingency plan	Contingency Plan	
2.	Head Plant Engineering shall ensure availability of stand by equipment.	-do-	
3.	Section In-charge shall ensure stock availability of spare parts required for contingency plan for key equipment failure.	-do-	
4.	Corrective and preventive actions are taken for all contingencies.	-do-	
5.	The Outcome and Reason for contingencies is reviewed in the MRM.	MRM Meeting	

Following contingencies are identified by the organization after brainstorming or multidisciplinary team in the organization

S. No.	TYPE OF CONTINGENCIES	INCIDENCES	CONTINGENCY PLAN/ CONTROLS	RESP.
1.	Key Equipment Failure	Break Down	Contingency plan for Production continuity in the event of equipment break down	
a.	Jig & Fixture Break Down	Equipment / tool downtime from 1 Hrs. - 10 days	<ul style="list-style-type: none"> • Fixture repairing (from minor to major repairs) • Inventory • New Purchase 	
b.	EOT Crane	Equipment / tool downtime from 1 Hrs. - 10 days	<ul style="list-style-type: none"> • Repair • Alternate Option 	
2.	Key IMT Equipment Failure	Test equipment/ Electrical equipment	<ul style="list-style-type: none"> • Accept lot under deviation • New purchase 	
3.	Utility Interruptions	Power Failure	<ul style="list-style-type: none"> • Generator Back-up is there. 	
		Compressed Air	<ul style="list-style-type: none"> • Spare Compressor available • Air Receiver Tank available for change load on alternate compressor 	
		Transformer Failure	<ul style="list-style-type: none"> • Changeover to another transformer 	
		Bore well	<ul style="list-style-type: none"> • Overhead, Service and Underground storage tanks • Tanker supply 	
4.	Manpower	Manpower Shortages	<ul style="list-style-type: none"> • Contractual manpower provision is outsourced. • Multiple Skill Training to existing workers • Apprentice Trainees are also available as buffer. • List of Agencies who provide manpower support. • Succession Plan 	

5.	Strike	Dispute / Disagreement for activity / execution of work between Management and employee	<ul style="list-style-type: none"> • Apprentice Trainees are also available as buffer. • List of Agencies who provide manpower support in Vadodara • Negotiation between Management and employee 	
6.	Sexual harassment	Sexual Harassment Mis behavior with minority	<ul style="list-style-type: none"> • CCTV deployment • Awareness of rules • Discipline 	
7.	Supply chain disruptions	Strike at Single Source Suppliers end.	<ul style="list-style-type: none"> • Stock is maintained as relevant • List of Alternate suppliers 	
		Transportation Problem	<ul style="list-style-type: none"> • Alternate transportation facilities 	
8.	Field Returns	Return from customer (Zonal Railways)	<ul style="list-style-type: none"> • Replacement of failed part of the product • Rework at onsite • Rework at railways workshops • Field return issues/concerns are analyzed & appropriate actions are decided by Dy. CQM 	
9.	IT- Related	Disruption of local IT system	<ul style="list-style-type: none"> • Preventive Maintenance & Servicing • Break Down Maintenance & corrective action • AMC agreement • Back up • Network Diagram 	
10.	Leadership (Succession planning)	Top Management Level vacancy	<ul style="list-style-type: none"> • Requirement as per railway policy • Additional charge of concern work to next level officer 	
		Department. Head Level vacancy	<ul style="list-style-type: none"> • Other Department head given temporary charge • Requirement as per railway policy • Functional Responsibility to other Department personnel 	

11.	Project Management	Stoppage of Work	<ul style="list-style-type: none"> • Taken care by Risk and Opportunity management of Project management procedures 	
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PLANNING THE CONTINGENCY PLAN VALIDATION

CONTINGENCY ISSUES	MONTH			
	Q1	Q2	Q3	Q4
Power Failure		X		

CONTINGENCY PLAN VALIDATION

Issue: Power Failure

Contingency plan: Use Diesel Generator Back-up

Required capacity to run the plant – 6000 KVA

Available capacity with existing DG sets – 8100 KVA (**DG1- 1500 KVA, DG2- 2000 KVA, DG3- 2300 KVA, DG4- 2300 KVA**)

Identify the risk related to DG sets as follows

Are the following risks possible?	yes	no	Current control available	Significance (considering probability of occurrence also)		
				high	medium	low
DG sets do not operate when required.	x		-AMC -regular running -Spares -SOP	x		
Fuel not available	x		-Fuel stock register -Check for leakage -SOP		x	

Operator not available	x		-Daily shift Rota	x		
Because of natural disaster, DG sets cannot be operated immediately		x	-AMC		x	

Key take away from above Risk analysis – nil

Procedure for Validation-

1. Run all the DG sets in suitable combination to suit plant operation for minimum 24 hours (It is part of SOP),
2. note down TGR/TGW,
3. Initiate actions to fix the issue,
4. Re validate,
5. Initiate actions to fix the issues,
6. Revalidate (till no new issue surfaces),
7. standardize the findings

	TGR/TGW	Actions planned to fix the issue	Actions taken	Re validation required?	
DG1- 1500 KVA	Could not run for more than 5 hours as it was incredibly old - 10 years	Reliable for 4 hours only; plan for CAPEX, Use only when any one of DG-2, DG-3, DG-4 is not working.	Organization overhauled the DG set in place of new one, it cost 5,000 (cost for new DG set is 25,000), it is validated, it was run for 48 hours nonstop, then after a brief preventive maintenance again run for 48 hours. However, power cost is 1.25 times more than DG-2, DG-3, DG-4	no	

DG2- 2000 KVA	3 times tripped	Repair immediately 2-year-old, still in warranty	Supplier penalized, some major manufacturing fault in the supplied DG Set, replaced the DG set, now working satisfactorily for 24 hours running, PM plan for all the 4 DG set reviewed and linked with maintenance department's employee bonus	no	
DG3- 2300 KVA	Run smoothly	Maintain	PM plan adherence ensured	no	
DG4- 2300 KVA	Pump supplying fuel to DG set got mal function after 2,5 hours; no spare pump	Provide spare pumps for DG-4; See if all DG have same fuel pump, if not standardize it Provide one spare pump in store	Fuel pump of same specification provided on all 4 DG sets, and one kept in store as spare. Dg set is running 24 hours satisfactorily	no	

KEY LEARNINGS FROM THE VALIDATION-

REQUIRED CAPACITY - 6000 KVA,

EXTECTED AVAILABLE CAPACITY – 8100 KVA.

ACTUALLY, AVAILABLE CAPACITY – 2300 KVA, 1500 KVA FOR 4 HOURS,

CONTINGENCY PLAN FAILED !

STANDARDISATION AFTER REVALIDATION

SOP revised to include better control on outsource process i.e. AMC,

Parts list revised to include fuel pump specifications; previous fuel pump master deleted from the system to prevent any error.

In PM plan fuel pump maintenance as well fuel gauge calibration initiated.

Risk registers revisited, modified as follows, shown in *Italic*

Are the following risks possible?	yes	no	Current control available	Significance (considering probability of occurrence also)		
				high	medium	low
DG sets do not operate when required.	x		-AMC -regular running -Spares -SOP	x		
Fuel not available	x		-Fuel stock register -Check for leakage -SOP		x	
Operator not available	x		-Daily shift Rota	x		
Because of natural disaster, DG sets cannot be operated immediately		x	-AMC		x	
Issue related to Fuel pump	x		-Standardization of fuel pump, -Spares		x	

KEY LEARNINGS FROM THE RE VALIDATION -

REQUIRED CAPACITY - 6000 KVA,

EXTECTED AVAILABLE CAPACITY – 8100 KVA (BEFORE 1ST VALIDATION)

CALCULATED CAPACITY – 2300 KVA, 1500 KVA FOR 4 HOURS (AFTER 1ST VALIDATION),

**NOW ACTUALLY AVAILABLE CAPACITY – 6600 KVA WITH OPTIMUM COST AND
ADDITIONAL CAPACITY OF 1500 KVA AVAILABLE WITH 1.25X COST**

CONTIGENCY PLAN SUCCESSFUL!

- **H K AGRAWAL**