



Disaster Recovery

What is a Disaster Recovery Plan

What should I plan for

Who should help develop this plan

What information should be included in the plan



KEA Requirements

<p>1. Does the site have an electrical system emergency or disaster recovery or contingency plan?</p> <p>No effort started in this area</p>	<p>N</p>	<ul style="list-style-type: none">• It is recommended that this be part of the site business continuity plan.• The emergency recovery plan should include a listing of disaster recovery, repair, and replacement resources for all critical equipment, such as transformers, large or critical motors, circuit breakers, switchgear, generators, and cable systems.• Review the emergency recovery plan for availability of replacement equipment, and expected timing for repair or replacement, including delivery and installation.	<ul style="list-style-type: none">• Develop disaster recovery plan and include both natural disasters and equipment failures that could impact reliability of the site.• Get involvement from plant leadership and include this plan with site overall continuity plan. The power system can have a huge impact on business continuity.• Identify critical failure points or equipment that would require significant down time to repair or replace• Identify critical technical and vendor resources ahead of time• Include all module ESO's in process
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What is a Disaster Recovery Plan



- Predetermined plan of recovery from disasters caused by acts of nature or unplanned equipment or facility failures impacting business continuity for an extended period of time.
 - Disaster –
 - An occurrence causing widespread destruction and distress; a catastrophe.
 - A grave misfortune.



Why Plan Now

- The ability to recover is directly related to the amount of time given to:
 - Identifying those things that could impact the business
 - Equipment failures
 - Transformers
 - Key or critical large motors
 - UPS and battery systems
 - LV and MV Switchgear failures
 - Building fire
 - Other utility system failure (boiler explosion)
 - Natural disasters
 - Tornadoes *
 - Hurricanes *
 - Earthquakes *
 - Floods *

* - Things that P&G has dealt with past 15 years



Why Plan Now

When it happens everyone is stunned

- Make informed decisions how you want to manage the risks.
 - Business continuity
 - Time to recover
- Allows you to put a plan into action instead of creating one on the fly
- Enables you to enlist help of other resources now instead of when everyone is pulled multiple directions
 - Internal and external resources
- Investigate what key vendors / suppliers you need on your team for recovery
 - Utility Company
 - Contracting companies
 - Specific equipment vendors
- Identify critical documentation to assist in recovery
 - Have hard copies
 - Keep in safe place
- You may identify things during plan to mitigate risk now

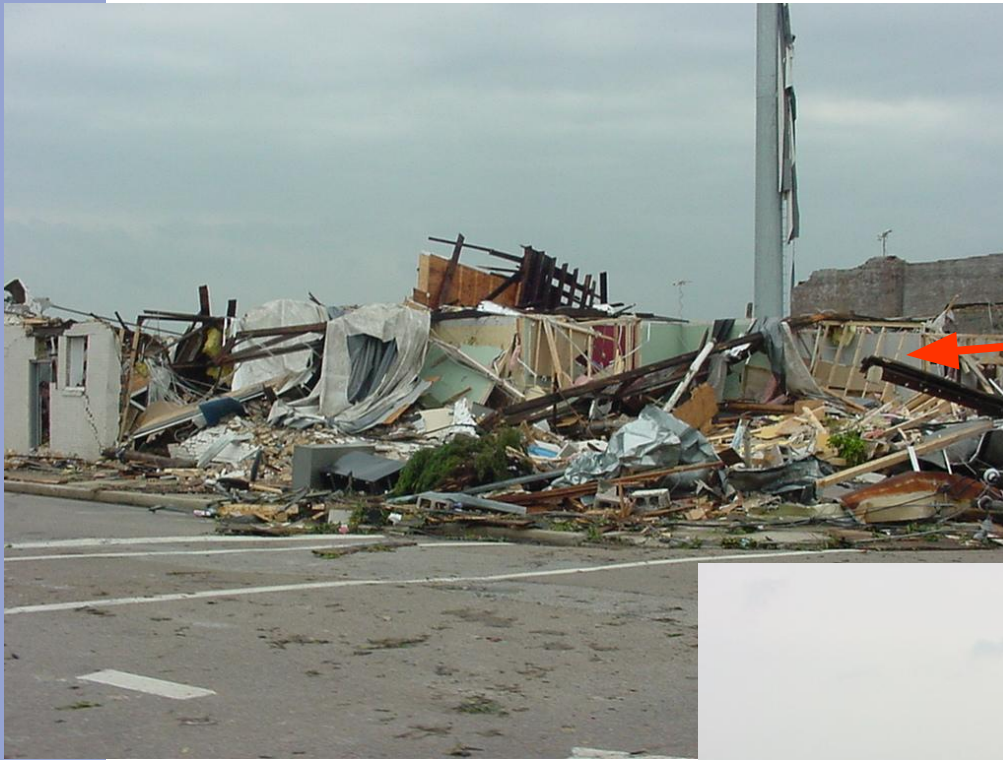


Why Document Plan

- Allows leadership to understand your recovery process and limitations now
- Communicate to leadership resources and cost required to be prepared.
 - Keep in mind, they may not be willing to pre spend for a faster recovery
- Educates others while being part of the process to develop the plan
- Can be useful to transfer knowledge to others
- Can and should be improved upon as things change

What to Plan Against

- Identify your vulnerable systems or equipment
 - Utility connection and distribution system
 - Pole line or underground
 - Multiple supplies or one
 - Switching capability of utility system
 - Power delivery equipment
 - 15kV cabling
 - Switchgear MV & LV
 - Age
 - Indoor / Outdoor
 - Installation and accessibility
 - Type of transformer
 - Oil or dry
 - Vaportran



Local Community Problems

Focus for utility and community will be here instead of industrial customers like P&G.

On site pole line distribution system problems





Main 46kV Utility
distribution systems
destroyed

Indicates severe
infrastructure damage





Incoming switchgear failure impacting entire Plant. Old equipment may be hard to support and repair. Where do you go for help? What would help look like? Plant could be down for lengthy time.



Key Vendors

- Repair shops
 - Motors
 - Switchgear
- Local Suppliers
 - Cable systems – LV and MV
 - Do they stock your type of cable
 - How long will it take to have on site
 - Temporary generators and fuel
 - May want to establish critical supplier relationship
 - May be considered insurance at a cost
 - Based upon vulnerability and accessibility
 - Pole line contractors
 - Installation contractors



Natural Disaster Watchouts

- Restoring power to industrial customers is low priority for Utility Companies
- Everyone is looking for help
 - Wide spread damage
- Resources are tapped out
- Prices can go up
- Some key plant staff may be unavailable
- Getting to where you are may be difficult
 - Airports closed
 - Storm damage
- Communication and networks probably not available



Prioritize Your Recovery

- Make the situation as safe as possible
 - Turn off power, isolate and lock out
- Mobilize your resources
 - Ok to overstaff
 - Internal and external
- Identify damaged equipment and potential scope
- Determine what documentation you may need.
 - Singlelines
 - Coordination study
 - Site layout
 - Equipment documentation
 - Operating instructions
- Communicate scope of problem and provide best guess for timing to recover

Other Things to Include

- Resource list
 - Vendors, contractors and internal and external technical resources
 - Could be based upon equipment type
 - Transformers, motors, switchgear
- Special safety precautions
 - Making system or plant safe electrically
 - Liquid spills
 - Switching and energizing authorization
 - Utility and internal

Questions

