Electrician fatally electrocuted

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An on-call electrician from the maintenance department was called in to check on a malfunction at a land-based oil installation.

What happened?

Besides checking the wells, he also went to the substation pole. At the substation (on poles), he opened the padlock at the low voltage (LV) distribution board and he disconnected the loads for all seven wells at the site by operating the two shutdown switches (circuit breakers).

Afterwards, the electrician climbed onto the pole and went on the platform to check – very likely – if the high voltage fuse was broken. Once on the platform, he was in the 'dead zone' (approximately 1m around 20kV installations) and he was almost immediately electrocuted as a result of an arc-blast. The electrician was found dead on the ground (having fallen from height as well) with severe burns on his back and on his left hand.

What went wrong?

- Inadequate risk assessment/JSA – the electrician was in a hurry, under self-imposed pressure and distracted, which did not allow him to properly assess the risks
- Weaker safety culture during weekends – safe working rules were less likely to be followed during the weekend;
- Complacency – no one in the organization stopped the electrician working alone on the electrical activities (and also working at height)
- Poor electrical reliability/availability of aged electrical equipment – equipment was compromised and degraded owing to age and poor maintenance
- Poor safety and security of electrical facilities – there was easy access to the live parts
- No up-to-date electrical schematics and checklist available at site
- PTW – there were no competent personnel reviewing and approving electrical work permits. There had been previous fatal incidents from which lessons had not yet been learnt
- Poor work planning – the maintenance organization did not have sufficient personnel to safely deal with these preventive and corrective maintenance jobs.

Corrective actions:

- Structural upgrade of old equipment
- Review PTW procedure for electrical jobs, sign off by electrical supervisor, in addition to sign off by production co-ordinator and review the roles; . Implement fully the recommendations of the previous electrical fatality incidents (including locking, signing, obstructing) and do a root cause analysis why recommendations were not implemented
- Implement an additional mechanical barrier at distribution cabinet to prevent lone working
- Ensure checklists and instruction documentation are available in every distribution cabinet
- Enhance safe behaviour and improve safety culture by:
  - implementing safety behaviour based program
  - consequence management (planned), including the complacency component for supervisors and managers
  - consider implementing spot checks and management walk-arounds during weekends/call off periods
- Identify clearly what kind of critical works should take place at weekends and at other times.