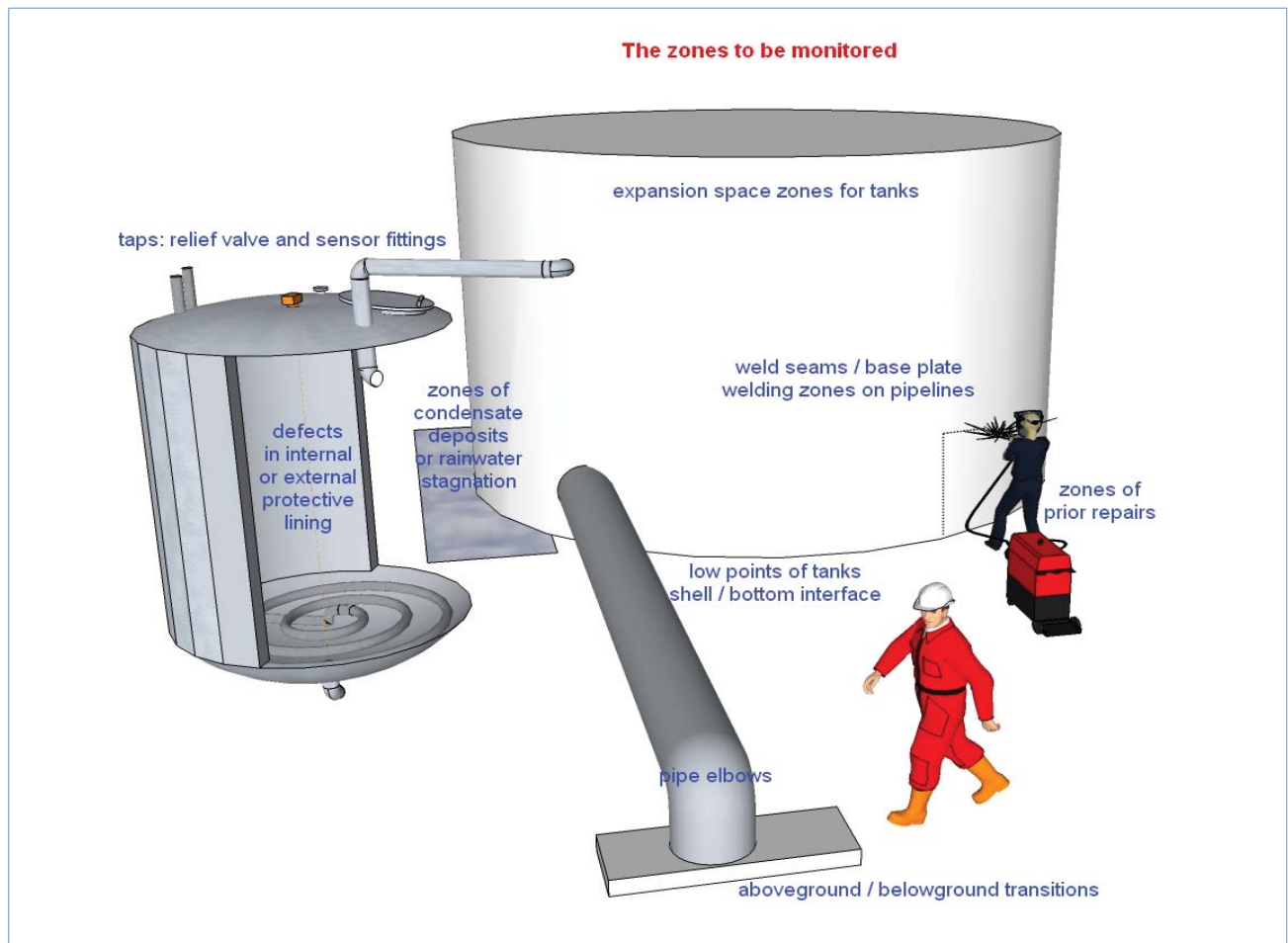


6. Causes

a) Initial causes (disturbances)

Such causes naturally consist of equipment malfunctions, as manifested by leaks or broken machinery. Cases of leaks or breaks are, in over 10 % of all events catalogued, due to either corrosion phenomena (31 cases recorded) or material fatigue problems (ARIA 38751, 39526, 44430). Such disturbances become magnified when the equipment is older (ARIA 42897). Let's recall that in the study produced by BARPI in 2014 on corrosion-related accidents, the zones indicated in the following diagram had been identified as particularly accident prone. The observations reported during this previous study have in fact been adapted to the special case of pressure equipment.



Anomalies raising doubts over equipment design are sometimes mentioned in the accident summaries (ARIA 43587).

Beyond physical defects, human deficiencies are the cause of a number of accidents:

- works carried out on equipment that has not been adequately depressurised, while also failing to consult the appropriate technical documentation beforehand (ARIA 42946);
- damage to a plant's piping network caused by a forklift driver (ARIA 44142, 44448);
- insufficient bolt clamping, resulting in leaks in the vicinity of flange joints (ARIA 44911, problems on LPG tanks: ARIA 45310, 45352, 45476);
- incorrect set pressure applied to relief valves (ARIA 45670).