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Well Integrity Engineering



Objectives

- An operator wanted to perform a comprehensive well integrity review targeting a 10% across 700 onshore wells and 200 offshore wells
- With a portfolio containing aging wells (field development was in 1935), a number of these had significant annulus pressures, pronounced surface and subsurface corrosion, and visible surface leakage
- The well stock comprised of subsea wells, oil and gas producers, gas injector, water injector, and observation wells
- Requirements:
 - Identify potential for integrity failures
 - Review casing and cementing practices with a view to improving integrity
 - Develop effective, practical and fit-for-purpose integrity management procedures
 - Review of downhole safety management procedures
 - Evaluate the barrier philosophy to maintain barrier integrity

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- A dedicated team of three engineers were assigned to the clients offices in the Middle East with the primary responsibility of gathering data and information on each of the 900 wells and subsequently rank them in accordance to their susceptibility to failure
- Rankings were performed by assigning quantitative values to the following criteria: presence of A, B, C annulus pressures; age of well; aquifers transversed; well type

(injector/producer); water cut; production rates; GOR; number of casing; natural flowing or artificially lifted; WHP; well status (shut-in/flowing) – wells were then classified into low, medium or high hazard wells

- A total of 120 wells were selected as a representative sample of the three hazard classifications and a comprehensive well-by-well integrity review was undertaken according the requirements of the scope of work
- Throughout the project, continuous technical support and input was provided by the EGIS subsurface engineering team

Value to client

- A well by well review identifying potential subsurface leaks and failures – the results of the sample saw 5% of wells fall into the high risk category, 75% into the medium risk category, and 15% into the low risk category
- Current practices were reviewed, and subsequently comprehensive wellhead maintenance, integrity management and annulus pressure monitoring plans were put in place
- An analysis of current cementing practices and recommendations on possible improvements
- A subsurface safety valve (SSSV) review based on proximity to populated areas
- Implementation of the recommended integrity management procedures
- Remedial action on high and medium risk wells were recorded in Expro's SafeWells well integrity software to allow for future maintenance to be scheduled

Contact

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