Well Integrity Gap Analysis

Well integrity as a discipline began evolving in the 1990s as agencies identified the issue and began raising awareness. It was determined that a robust well integrity process covers the entire life cycle of the well beginning with well design and carrying through abandonment. Depending on the hydrocarbon composition, well complexity, regulatory oversight, and company approach, there is considerable variance around the globe on how this has been deployed.

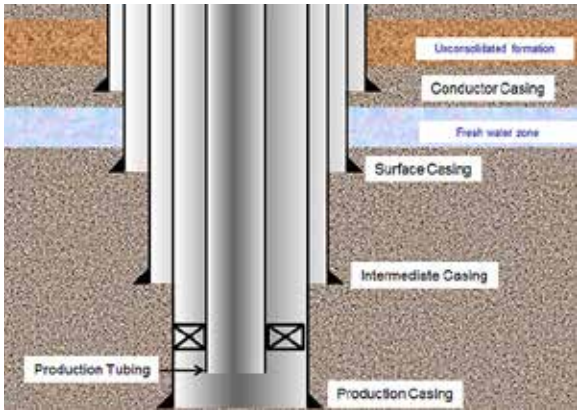
Implementation of a successful well integrity management system (WIMS) will have significant positive impacts for any organization. These include:

- Improved HSE
- Protection of assets reputation and rights to operate
- Extended well life and increased production
- Reduced workover and intervention costs
- Improved well documentation
- Improved cross-organizational communication
- Enhanced engineering productivity

The process will review the existing Well Integrity Management System or other systems in place and provide a gap analysis with recommendations to address the specific items.

The focus areas will include, but will not be limited to:

Current System: The level of well integrity implementation may range from non-existent to cursory to industry leader. Regardless of the implementation level, a third-party review will reveal gaps and opportunities to enhance the process.



Well Stock: It is imperative to review the entire well stock in the field and develop a holistic overview. Some of the wells, including already abandoned wells, can pose risks that are not visible under normal scrutiny.

- Total wells in field
- Abandoned wells
- Shut-in wells
- Injection wells
- Disposal wells
- Producing wells
  - Naturally flowing
  - Sucker rod pumps
  - Electric submersible pumps
  - Gas lift
  - Other

New Well Design: Because well integrity is a life-of-well responsibility, it should be addressed in a well or field's basis of design. Some of the specific topics are:

- Metallurgy suitability for initial wellbore fluids
- Metallurgy suitability over the life of the field, particularly with increase of water or H_2S
- Barrier envelope
- Zonal isolation
- Abandonment criteria

Well Records: Each well will have significant documentation tied to it:

- As-installed wellbore, wellhead and tree schematics
- Well handover documentation
- Cased and production logs
- Sustained casing pressure database
- Abandoned well schematics
- Interventions documentation
- Centralized well file systems

Surveillance: Over the life of the well, the production/surveillance teams will conduct periodic assessments on well stock. This will vary from field to field and company to company. These activities may include:

- Wellhead and tree inspections
- Production logs
- Corrosion logs
- Casing thickness logs
- Annulus mechanical integrity evaluations

Compliance: The process will identify areas where a gap may exist to adherence to applicable policies, procedures, and regulations. Some of the areas of investigation include:

Company well integrity systems:

- Barrier policies
- Zonal isolation
- Breaking containment policies

Regulatory:

- Well policies
- Reporting requirements
- Well diagnostics to satisfy regulatory needs

The well integrity gap assessment is the initial step to clearly understand the current implementation level. It will help the company develop a way forward that prioritizes critical items. The specific scope of work will be tailored to meet the client's requirement for the field and can be delivered in phases to meet budgetary concerns. With the closure of each gap, there will be a positive impact on the organization.

Ultimately, this activity will provide clarity of the well integrity status for the producing and shut-in well stock. This will lead to more efficient operations that include enhanced safety and reduced operational and environmental risks.

For additional information, please contact:
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