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Casing Deformations

- a challenge to be managed

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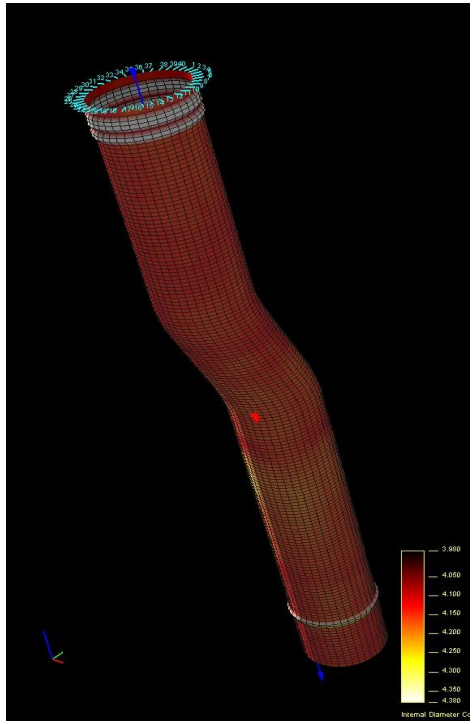
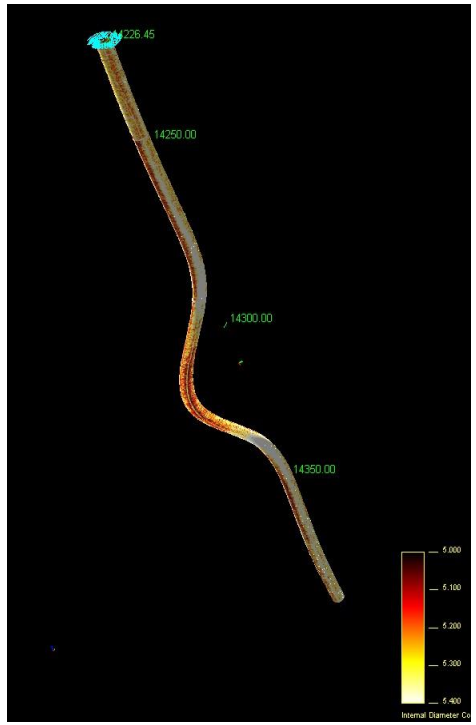
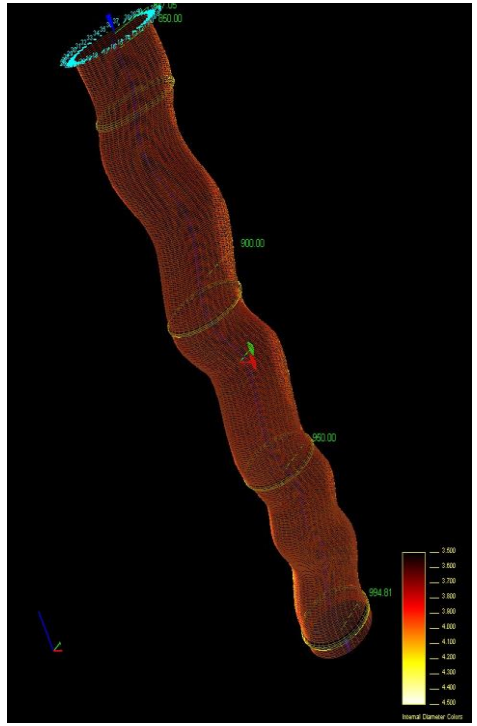
Casing Deformations

- The Challenge
  - Greater Ekofisk Area: Subsidence can lead to damaged casing/ tubing
  - Can have impact on Well Integrity
  - Limited wellbore access for Well Intervention jobs
  - Limited wellbore access for P&A work

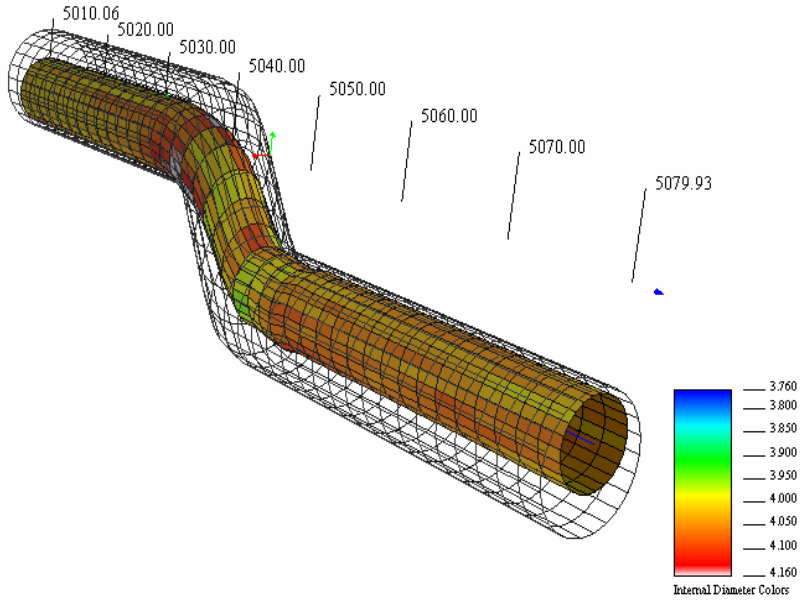


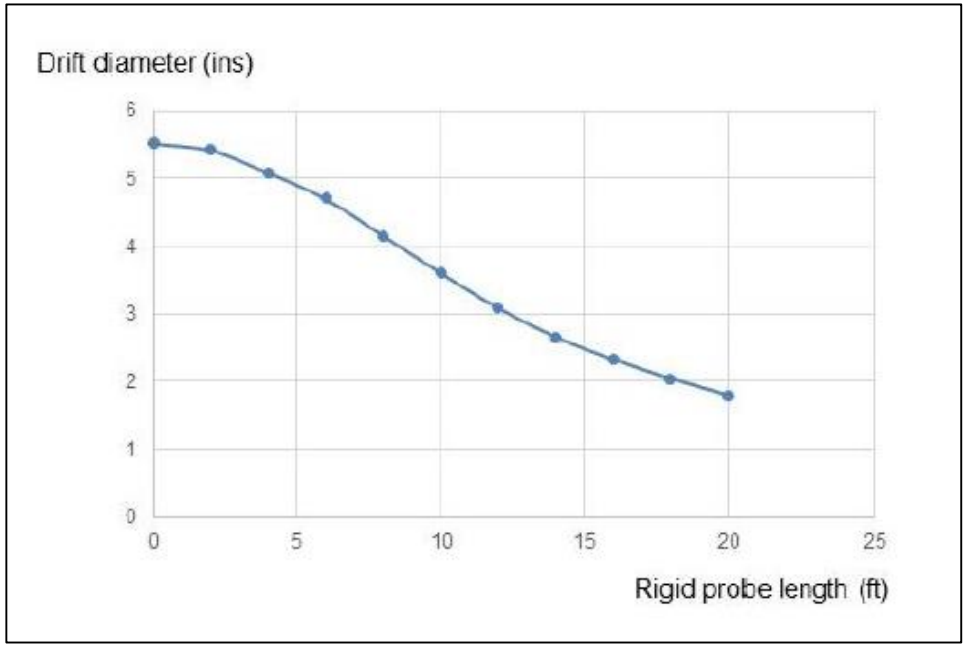




Casing Deformations

- How to manage
  - Monitor wells and development of any restrictions/ deformations
  - Drift tubing - run Multi Finger Caliper (MFC)
  - Perform Pipe Deformation Analysis (PDA)
  - Perform PP&A when still having wellbore access





Casing Deformations – How we use MFC and PDA

Well Integrity Team **Monitoring**	**Well Intervention Team** **Plan & Execute** **WI Operations**	**P&A Team** **Plan & Execute** **DP Based Operations**
Drift tubing/ run MFC	Maintain and update a Best Practice for maximum flexible MFC BHA	If abnormalities: Plan punch and cut tubing
Identify abnormalities	Plan and execute drift operations as per Well Integrity call off	If abnormalities: Plan pulling of tubing
If abnormalities of interest: Build 3D model of tubing Extrapolate 3D model of casing Drift Chart	Potentially: Evaluate deformations vs planned/ needed SOW below	If abnormalities: Extrapolate 3D model of casing Drift Chart Plan plugging operation/ Select BHA
Potentially: Evaluate well integrity vs current access in tubing	Potentially: Advise on and source tubing punch/ cutting BHA's capable of making it through a deformation	After tubing pulled/ if abnormalities: Drift casing/ run MFC Verify casing geometry Provide data for GGRE
Potentially: Evaluate well integrity and or containment vs current access in casing		