



Society of Petroleum Engineers

SPE Wellbore Positioning, ISCWSA 62nd General Meeting

25th September 2025
Hilcorp Offices, Alaska, USA

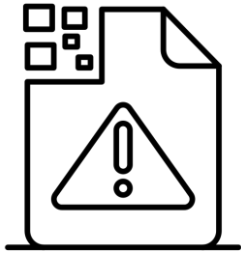


Standardized Integration of Multi-Vendor Surveys for Centralized Anti Collision Database

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Data Engineer, SLB

Objective/Scope



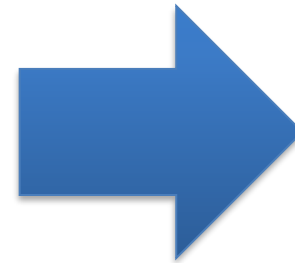
Chevron entity in Kuwait did not
have a centralized WP SoR



Inconsistent survey data of the
same well from different vendors



Surveys having incorrect
trajectory points and well header
values



Unified Master Survey Database
after applying rigorous quality
control framework

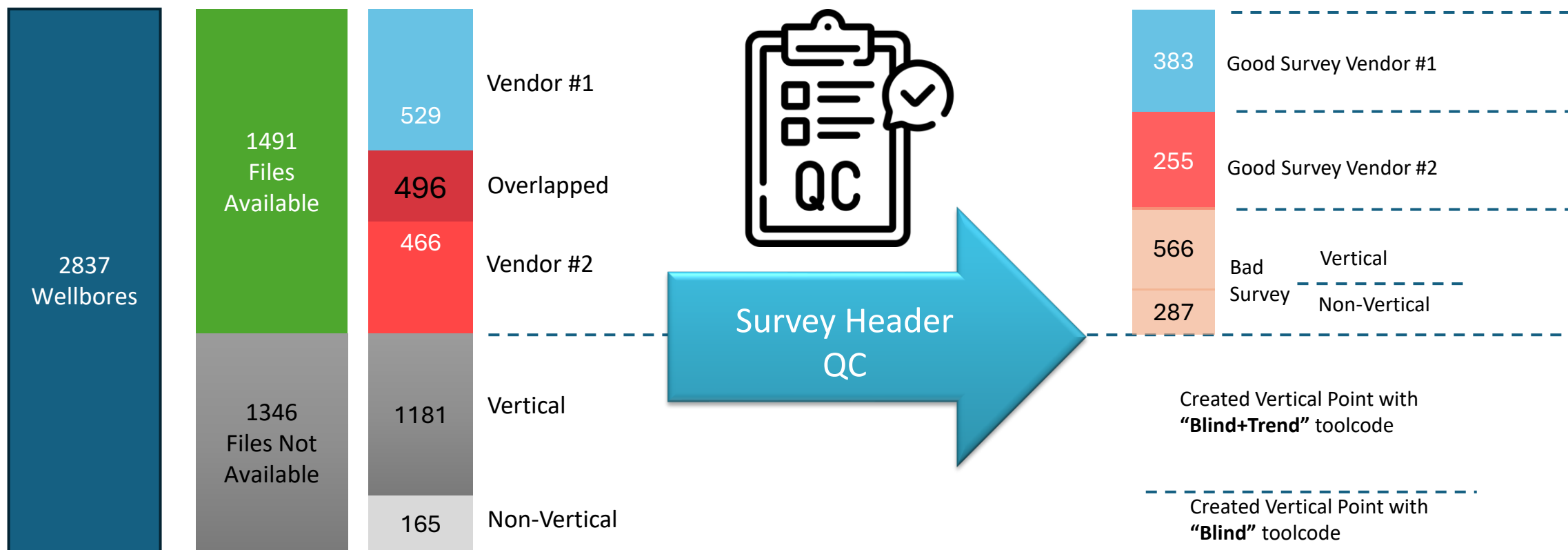


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Project Execution



* The file assessment was made per the collected vendors file **up until Jun 2025**

Data Sources :



SLB_BLIND+TREND

This error model may only be assigned on a case specific basis with the approval of the Area DEC Manager or GeoMarket DEC Manager. This error model is intended for use where no survey information was recorded but where some other information exists such as the BHA records or Bit-run summaries or some other relevant formation or drilling knowledge exists concerning the expected trends of the wellpath. This model is based on the BLIND model but contains less severe behavior because of the additional information available and incorporates a 3-degree per hundred-deviation capability.

SLB_BLIND

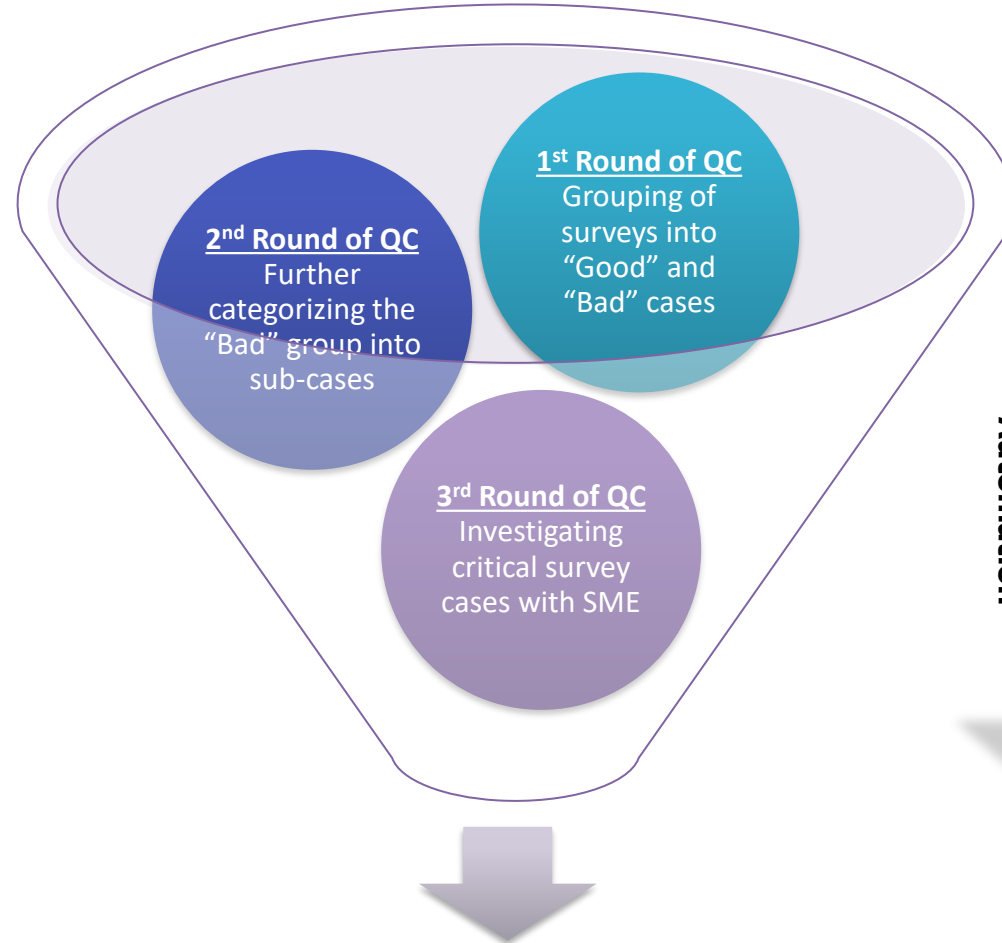
This error model is intended for use where no survey information was recorded or where that information no longer exists and there is no other supporting information to justify the use of any other error model. It is intended to ensure that a cone-based uncertainty is generated which would be practically impossible to have drilled out of. This model should never be used as the basis for satisfying the standard anticollision procedures clearance requirements without additional detailed risk assessment being carried out and documented in the well design file.

Survey QA/QC Process

Data Mining

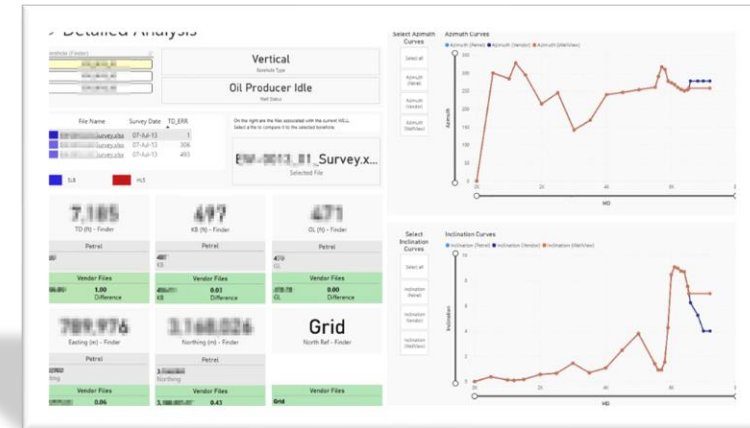
Python and VBA scripts
in collecting Daily Drilling
Report and Survey Report

Extracting survey info
from DDR using **Natural
Language Processing
(NLP)** capability



Python script in grouping and applying action to the survey files per action agreed by the business

Automation



Detailed Analysis via Power BI Dashboard

QC-ed Database

1st Round of QC

Categorization	Good Vendor Survey	Bad Vendor Survey**	Assumed Vertical	Assumed Non-Vertical
Vendor Survey Files Available	✓	✓	✗	✗
Survey Location = Finder Location	✓	✗	—	—
Survey Elevation = Finder Elevation	✓	✗	—	—
Survey TD = Finder TD	✓	✗	—	—
Having more than 5 survey stations	✓	✗	—	—
Vertical Survey*	✓	✓	✓	✗
Non-Vertical Survey*	✓	✓	✗	✓

Legends:

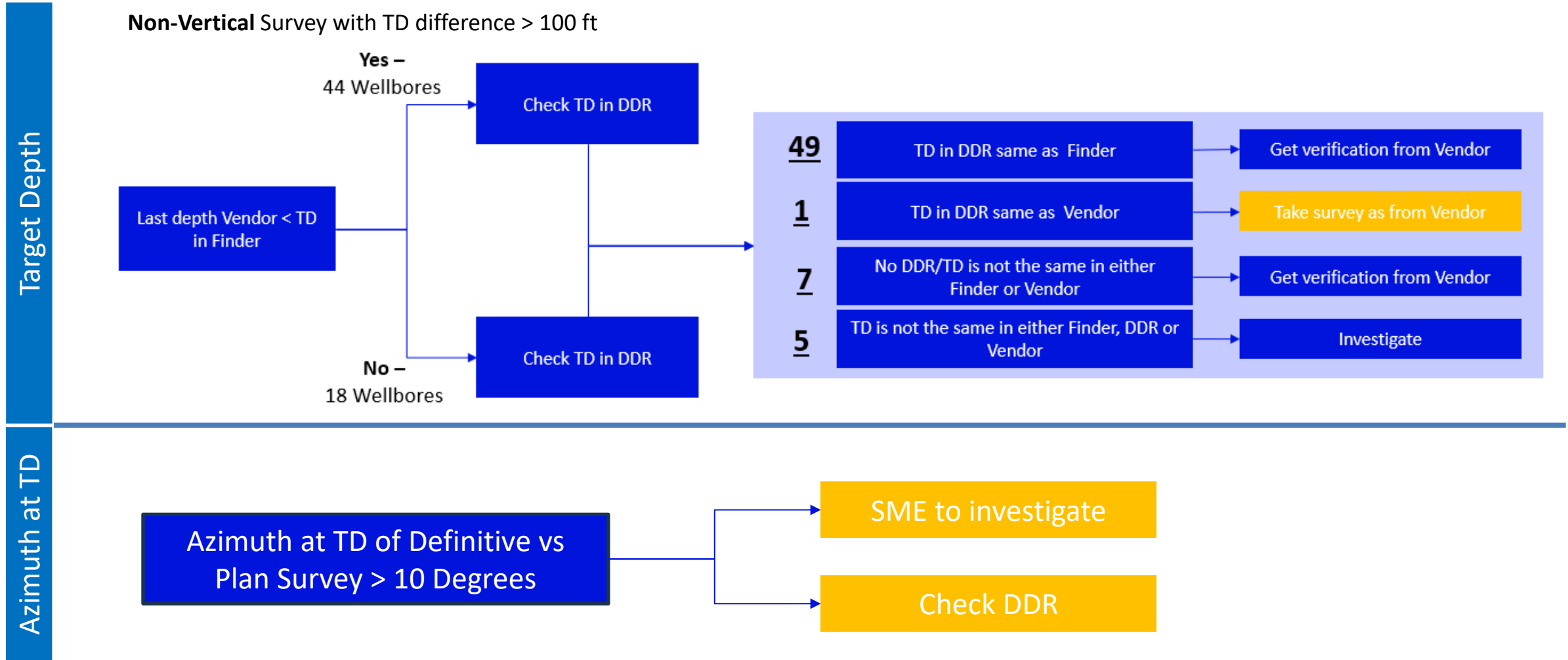
- Not Applicable
- ✓ Pass QC step check
- ✗ Did not pass QC step check

Note: *The classification of vertical and non-vertical surveys is taken from Finder
 ** If any of the QC step check did not pass, then it is categorized as Bad Survey

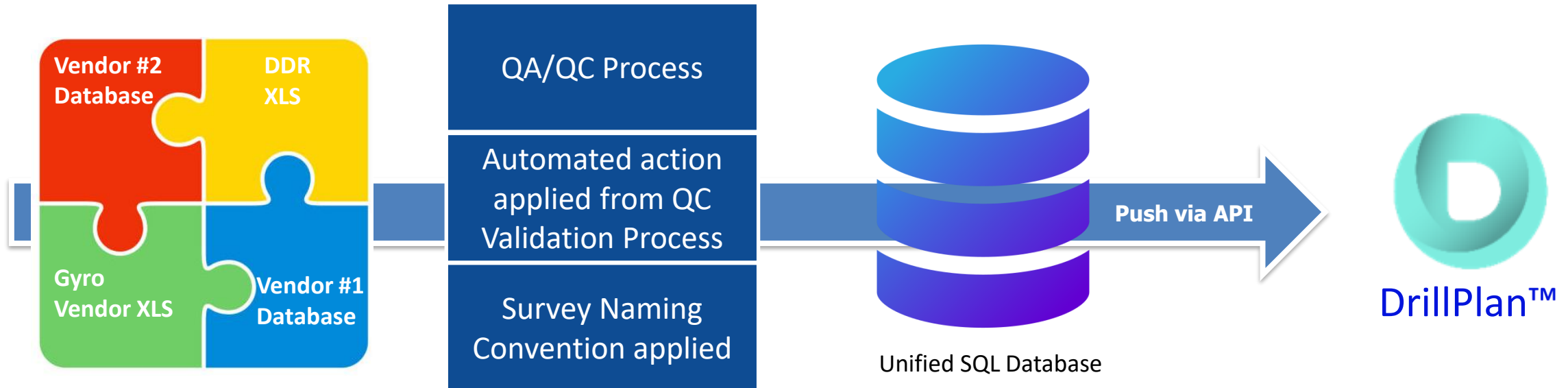
2nd Round of QC

Surface Location Difference	Elevation Difference	TD Difference	Survey Points	Entirely Different Well Header
Location distance < 1 m	Vendor GL = 0 ft	TD difference < 10 ft	Only 2 Survey Depth Points	Different location (> 200 m) , KL, GL & TD
	Vendor GL and RKB = 0 ft	TD difference < 20 ft	Azimuth at TD between definitive survey and plan survey > 10 degrees	
	Vendor have different GL	TD difference > 20 ft		
	Vendor have different RKB			
	Vendor have different RKB & GL			

3rd Round of QC



Ingestion Process to WP SoR (DrillPlan)



Future Enhancement of the Master Survey Database

Below survey naming convention was used to quickly identity QC steps that was applied :

Scenario	Naming Convention
Good Vendor Survey	<Multi-Vendor/Gyro>_Survey_<Wellbore Name>
Assumed Vertical	Vertical_Assumed_Survey_<Wellbore Name>
Assumed Non-Vertical	NonVertical_Assumed_Survey_<Wellbore Name>
Bad Vendor Survey (General Validation workflow)	<Multi-Vendor/Gyro>_Val_Survey_<Wellbore Name>
Bad Vendor Survey (Re-Survey Required)	<Multi-Vendor/Gyro>_P30_Survey_<Wellbore Name>

1. Re-survey the wells that are in critical cases, and update DrillPlan Master Survey Database
2. Workflow to automatically capture all future gyro and drilling job run by Chevron, which to be update in the Master Survey Database
3. Automated Survey QC process and Ingestion to DrillPlan Master Survey Database

Team Collaboration



JOINT OPERATIONS

SAUDI ARABIAN CHEVRON INC - KUWAIT GULF OIL COMPANY (K.S.C.)



Thank you!

