

Integrating INTELLEX Offshore Data into your PPDM Database

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Agenda

- ◆ Business Objective
- ◆ Business Requirements
- ◆ Synchronization Process
- ◆ Technical Challenges
- ◆ Status
- ◆ Summary

Business Objective

A N A D A R K O

- ◆ **Technical Database (TDB)**
 - *Authoritative Geotechnical Data Store*
 - *PPDM 3.7.1*
- ◆ **INTELLEX Offshore Data**
- ◆ **Synchronize INTELLEX data to TDB**
 - *Users transfer data from TDB to Interpretation applications*

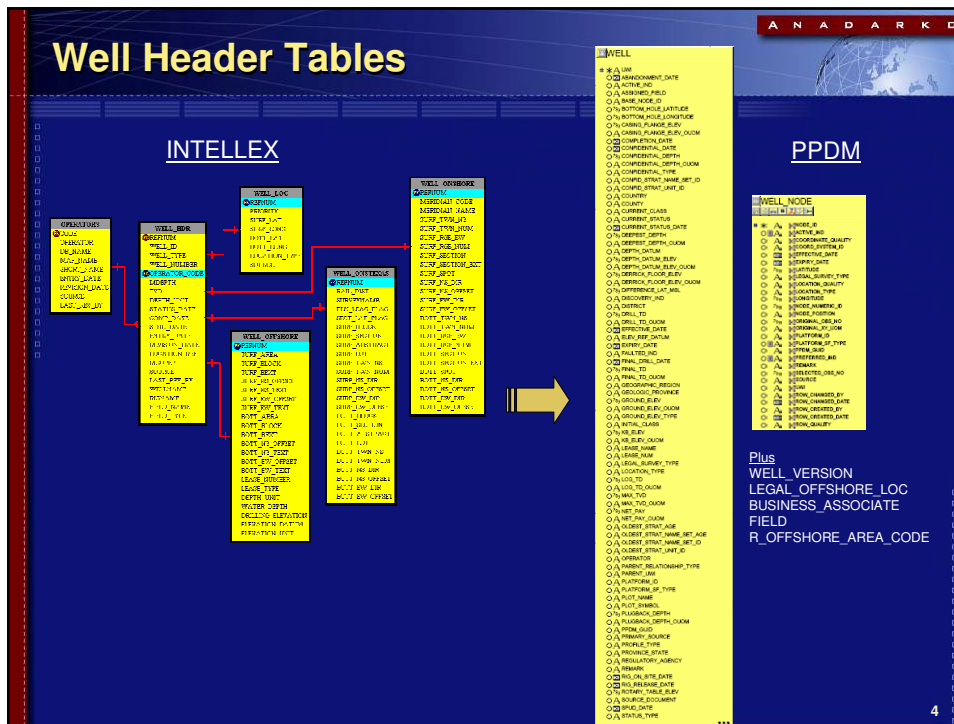
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Business Requirements

A N A D A R K O

- ◆ **Synchronize INTELLEX data to TDB**
 - *Scheduled and On-Demand*
 - *Full and Incremental*
 - *Based on Last Run Date (compare with REV_DATE, REVISION_DATE)*
- ◆ **INTELLEX Datasets**
 - *EII, EIP_OFFSHORE, GULF_MEXICO, MMS, SCOUT, and SCOUTCHECK*
- ◆ **Data Types**
 - *Well Header (with Legal Location)*
 - *Directional Survey - Composite and Run data*
 - *Paleo Tops (future)*
- ◆ **Business Rules**
 - *Populate PPDM VERsion tables*
 - *Promote from VERsion tables to "operational" tables based on source priority*
 - *Support P2 Energy Solutions Directional Survey Extensions*

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- ## Well Header Synchronization
- ◆ **INTELLEX Datasets**
 - GULF_MEXICO, EIP_OFFSHORE, SCOUTCHECK, and SCOUT datasets
 - Additional datasets should be compatible (standard structure)
 - ◆ **Synchronize all Well Versions**
 - Map INTELLEX Well records to WELL_VERSION
 - Use Dataset ID as SOURCE (GUL, EIP, SCO, SCT)
 - Promote “best” WELL_VERSION to WELL based on Source Priority
 - Order: GULF_MEXICO, EIP_OFFSHORE, SCOUTCHECK, SCOUT
 - ◆ **Synchronize Operators**
 - Pre-processing step: EGI_OPERATORS → BUSINESS_ASSOCIATE table
 - ◆ **Process Deleted INTELLEX Wells**
 - Mark INTELLEX Wells in PPDM as “deleted” when UWI no longer exists in INTELLEX database

Directional Survey Synchronization

A N A D A R K O

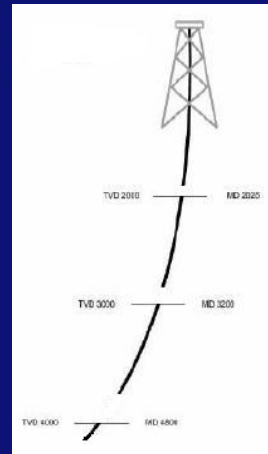
- ◆ **INTELLEX Datasets**
 - *EII, EIP_OFFSHORE, and MMS*
- ◆ **Synchronize Composite and Run data**
 - *Map to P2_WELL_DIR_SRVY_VER and P2_WELL_DIR_SRVY_STAT_VER*
 - *Promote "best" Composite Survey to WELL_DIR_SRVY/STAT*
 - Based on Source Priority Order: EII, EIP_OFFSHORE, MMS
- ◆ **Other**
 - *North Reference*
 - INTELLEX Surveys stored in Grid North
 - Anadarko standard is True North
 - *Computation Method*
 - Anadarko standard is Minimum Curvature
 - *Support P2 Energy Solutions Extensions*
 - *Process TIE Points*

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Processing Directional Surveys

A N A D A R K O

- ◆ **EII / EIP_OFFSHORE Surveys**
 - *Capture Composite and all Runs as Versions*
 - *Process Composite*
 - Recompute using Minimum Curvature
 - Correct to True North
 - Capture point type (STIE, MTIE, NORMAL)
 - *Process Run*
 - Capture Run's Compute Method
 - Capture Run's North Reference
 - Process using WDIR_SRUN depths
 - Capture Raw values, not Computed
 - Capture point type (STIE, MTIE, NORMAL)
- ◆ **MMS Surveys**
 - *Composite stored as a Version in PPDM*
 - Correct to True North
 - Recompute using Minimum Curvature



Run	Top Depth	Base Depth	Tie Point
1	0.0	1850.0	
2	2025.0	2965.0	2025.0
3	3200.0	4150.0	3200.0
4	4800.0	5125.0	4800.0

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Example: Directional Survey - Intellex

UWI: 427060012200
 MMS Survey: Composite only
 EII Survey: 3 Survey Run records, 1 Tie Point

WDIR_SSUM

dataset	top_depth	base_depth	surv_n_ref	oper_code
EII	480.0	9450.0	G	117

WDIR_SRUN (3 individual survey runs)

dataset	top_depth	base_depth	surv_date	surv_n_ref	surv_eqip_type	surv_cont
EII	480.0	2034.0	6/1/1967	G	MSS	SC007
EII	2225.0	6650.0	1/1/1967	G	MMS	SC007
EII	6716.0	9450.0	6/7/1967	G	MAG	SC007

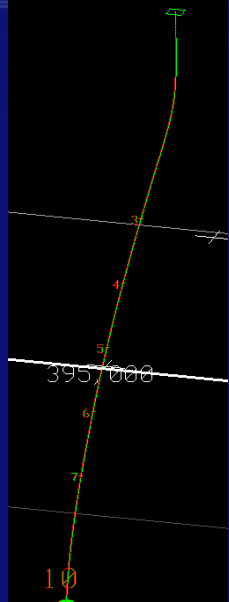
WDIR_TIES (1 surface tie point)

dataset	tie_type	mdepth	tdv	ns_offset	ns_dir	ew_offset	ew_dir
EII	STIE	480.00	479.91	7.26	S	3.33	W

WDIR_SURV (all survey points)

dataset	mdepth	tdv	inc_ang	azimuth	xoffset	yoffset	corr_azi
EII	0.00	0.00	0.00	180.00	0.00	0.00	180.00
EII	480.00	479.91	0.00	113.00	3.33	-7.26	113.00
EII	680.00	679.89	1.25	135.00	4.87	-8.80	135.00
EII	710.00	709.89	1.25	135.00	5.34	-9.27	135.00
...							
EII	9292.00	8773.58	14.75	62.00	2003.23	2013.65	62.00
EII	9450.00	8926.72	13.75	60.00	2037.25	2032.51	60.00

dataset	mdepth	tdv	inc_ang	azimuth	xoffset	yoffset	corr_azi
MMS	680.00	680.00	1.25	135.00	0.00	0.00	135.00
MMS	710.00	710.00	1.25	135.00	0.67	-0.70	135.00
...							
MMS	9292.00	8774.00	14.75	62.00	1997.45	2022.99	62.00
MMS	9450.00	8927.00	13.75	60.00	2031.34	2042.07	60.00



Example: Directional Survey - PPDM

P2_WELL_DIR_SRVY_VER

survey_id	source	top_depth	base_depth	azimuth	north_type	compute_method	survey_type	p2_bc	surv_report_type
0	EGIEII	480.0	9450.0		TRUE	MIN CURVE	COMB		COMPOSITE
1	EGIEII	480.0	2034.0		GRID NORTH	TANGENTIAL	MSS		RUN
2	EGIEII	2225.0	6650.0		GRID NORTH	TANGENTIAL	MMS		RUN
3	EGIEII	6716.0	9450.0		GRID NORTH	TANGENTIAL	MAG		RUN
0	EGIMMS	680.0	9450.0		ASSUM TRUE	MIN CURVE			COMPOSITE

P2_WELL_DIR_SRVY_STAT_VER (2 Composite, 3 Runs)

survey_id	source	depth_obs	no	station_md	inclination	azimuth	station_tdv	x_offset	y_offset	point_type
0	EGIEII	480		480.00	0.00	113.00				STIE
0	EGIEII	680		680.00	1.25	135.00				NORMAL
...										
0	EGIEII	9292		9292.00	14.72	62.00				NORMAL
0	EGIEII	9450		9450.00	13.75	60.00				NORMAL
1	EGIEII	480		480.00	0.00	113.00				NORMAL
1	EGIEII	680		680.00	1.25	135.00				NORMAL
...										
1	EGIEII	1911		1911.00	20.00	32.00				NORMAL
1	EGIEII	2034		2034.00	22.00	34.00				NORMAL
2	EGIEII	2225		2225.00	21.75	34.00				NORMAL
2	EGIEII	2403		2403.00	21.50	34.00				NORMAL
...										
2	EGIEII	6472		6472.00	21.50	50.00				NORMAL
2	EGIEII	6650		6650.00	21.00	52.00				NORMAL
3	EGIEII	6716		6716.00	21.25	50.00				NORMAL
3	EGIEII	6804		6804.00	21.50	50.00				NORMAL
...										
3	EGIEII	9292		9292.00	14.72	62.00				NORMAL
3	EGIEII	9450		9450.00	13.75	60.00				NORMAL
0	EGIMMS	680		680.00	1.25	135.00				NORMAL
0	EGIMMS	710		710.00	1.25	135.00				NORMAL
...										
0	EGIMMS	9292		9292.00	14.72	62.00				NORMAL
0	EGIMMS	9450		9450.00	13.75	60.00				NORMAL

Promote EII Composite Survey to WELL_DIR_SRVY and WELL_DIR_SRVY_STATION table since EII source is higher priority than MMS.

Technical Challenges

A N A D A R K D

- ◆ **Grid Correction**
 - *Using corrected and uncorrected values in various situations*
 - *Implemented Grid Convergence and Survey Computation algorithms*
- ◆ **Surv_Eqip_Type mapping**
 - *Maps to PPDM survey_type and survey_class*
- ◆ **Survey Date determination**
- ◆ **Survey Contractor reference values**
 - *Not stored in Intellex database*
- ◆ **Keeping reference values in sync**
- ◆ **Determining Survey Quality from INTELLEX**
 - *Use "Reported" for MMS and "Good" for EII Composites*

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Status

A N A D A R K D

- ◆ **Analysis – complete**
- ◆ **INTELLEX integration – complete**
- ◆ **PPDM integration – complete**
- ◆ **Data Mappings/Transformations – complete**
- ◆ **Synchronization implementation – July**
- ◆ **Acceptance – August**

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Summary

A N A D A R K O

- ◆ **Extensive data analysis required**
 - *Needed to truly understand INTELLEX data model*
 - *Required Anadarko, Energy Graphics and Volant*
- ◆ **Requirements definition took time**
 - *Determine HOW to capture data in PPDM*
- ◆ **Support P2 Survey model extensions**
- ◆ **Future**
 - *Proprietary dataset support*
 - *Paleo Tops support*

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Questions?

A N A D A R K O