

Use Case 3 (Transfer LWD Data from WITSML to PPDM)

Title: Transfer Real-time LWD data (e.g. gamma ray) using WITSML into PPDM data repository.

Use Case Name	Accept a Real-Time WITSML Feed for a Well Log and Store the Data in a PPDM Database.
Version	24June2013 V1.0 – Initial Release
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Goal	An Operating Company Drilling Department wants to record a real-time WITSML stream for an LWD log into a PPDM database in order to have a permanent record of the drilling operation in the corporate data repository.
Summary Description	The Operating Company wants to capture LWD data (e.g., Gamma Ray, ROP, etc) from the drilling contractor. Operator wants to capture real-time field log data in WITSML and store in corporate repository so that is readily available for petrophysical and geological workflows. This will enable greater collaboration across the organization; enable distributed workflow and timely decisions.
Actors	Identify and describe the primary and secondary actors that act on (primary) or are acted upon (secondary) by systems or processes described as being part of the use case. <ul style="list-style-type: none"> • Rig site drilling contractor • Rig site LWD Service Provider • Rig site WITSML Aggregation Service Provider • Remote Communications Service Provider • Office-based Operating Company Remote Operations Support Staff • Office-based Operating Company Technical Staff (drilling engineers, geoscientists)
Triggers	<ul style="list-style-type: none"> • The drilling engineer at the rig site initiates a run in the hole with an LWD instrument package part of the BHA, and • The Operating Company technical staff requests a real-time feed of the data back to the office
Pre-conditions	<ul style="list-style-type: none"> • The Operating Company must request LWD service from the LWD Service Provider • The LWD Service Provider must deploy the LWD (uphole and downhole) equipment to the rig site • The Aggregation Service Provider must interface to the LWD system • The Operating Company must request remote communications services from the Remote Communications Service Provider. • The Remote Communications Service Provider must deploy their (satellite) communications equipment to the rig site. • The Remote Communications Service Provider must establish the communications link from the rig site to their ground station. • The Operating Company Remote Operations Support Staff must establish connectivity between the Remote Communications Service

	<p>Provider's ground station and the Operating Company's Remote Operations Center</p> <ul style="list-style-type: none"> • The Aggregation Service Provider must interface their equipment to the Remote Communications Service Provider's rig site equipment • The LWD Service Provider, the Aggregation Service Provider and the Operating Company Remote Operations Support Staff must establish end-to-end connectivity and data flow from the rig site LWD equipment and the Operating Company's Remote Operations Center PPDM server.
Primary or Typical Scenario	<ul style="list-style-type: none"> • Once the aforementioned pre-conditions are met, the use case is as follows: • A member of the Operating Company Technical Staff requests The Operating Company Remote Operations Support Staff to provision a real-time WITSML feed from the rig in question and store the results in the corporate PPDM repository. • The Operating Company Remote Operations Support Staff contact the rig and inform the LWD Service Provider and the Aggregator Service Provider to enable the LWD service on the next run in the hole. • The LWD Service Provider works with the Drilling Contractor to add the LWD instrument package to the BHA • The LWD Service Provider and the Aggregator Service Provider set up the curve mnemonics mapping between the LWD surface system and the Aggregator system • The Operating Company Remote Operations Staff sets up a WITSML-to-PPDM Receiver Service in their environment to listen to the real-time feed from the rig • When operations commence, the Aggregator system maps the LWD input data feed into a WITSML output data stream • The WITSML data stream is sent from the rig over the communications link to the Operating Company's Remote Service Center • The WITSML-to-PPDM Receiver Service at the Operating Company Remote Service Center receives the data and writes it into the PPDM repository • The Operating Company Remote Service Center Staff monitors the transmission and its contents to ensure the data is being received and written properly • The Operating Company Technical Staff are informed that the data is being downloaded into the PPDM corporate repository
Alternative Scenarios	While not stated explicitly, this use case deals with loading the WITSML data into PPDM for reference (after the fact), rather than real-time, access
Post-conditions	Following from the previous section, after the use case is completed, the data that was streamed via WITSML will be properly stored in the PPDM corporate repository for general access
Business Rules	<p>Basic approach/considerations:</p> <ul style="list-style-type: none"> • Establish rig site communications capabilities • Provision LWD and data aggregation capabilities • Establish streaming WITSML connection from rig site to Operator Remote Operations Center • Parse WITSML and store meta-data about the curves in PPDM well log module • Store the original WITSML in records management module • Store curve values in the well log curve table • Store curve values as BLOBS to gain performance • Look at ramifications of storing as depth and time • Look at ramifications of different sample rates

	<ul style="list-style-type: none"> • Data from different streams/different sample rates • Look at ramifications of UOM and reference values/dictionaries • Look at business rules around capturing data to notify of changes/additions • Workflow consideration: <ol style="list-style-type: none"> 1. Instantiate the well (all pertinent header; location, elevation etc...) and 2. Receive a stream of value/s. • For brevity in transmission, the “header” is sent once at the start, thence a series of short messages containing only well, wellbore, log, and curve uids plus the value/s is sent as a stream. Add2Store accumulation.
Notes	<p>The coding for UOMs are encoded in the WITSML attributes. WITSML uses the POSC standard UOM nomenclature. Since PPDM allows an implementation to define its own UOMs, the “mnemonic mapping” step described above must include the associated mnemonics as well. TRUE – is comment sufficient for use case with documentation on PPDM and Energistics UOM architectures? Implementation decision; provide information in documentation to identify consideration.</p>
Definitions	<p>Include references to existing glossaries or dictionaries, as well as explicit definitions of terms used in the use case description that may be unfamiliar or unclear to a reader.</p>