

Corvelle Service Offering - NAD 83 Data Migration

Corvelle has successfully executed a NAD 83 Data Migration project for a major Canadian oil & gas producer.

Business Value

The value of executing a NAD 83 Data Migration project is to dramatically reduce or eliminate the risk of datum uncertainty creating adverse business consequences such as:

1. Drilling a non-commercial well because it was positioned in the wrong location.
2. Submitting data to a regulatory agency using the wrong datum.
3. Drilling a SAGD well pair with sub-optimum spacing between the wells.

Audience

Building an understanding of the NAD 83 data migration will typically interest oil & gas professionals in the following areas:

1. Exploration
2. Geomatics
3. GIS
4. Engineering
5. Seismic data acquisition vendors
6. Oil and gas industry software vendors

Industry Background

Momentum is growing within the Canadian oil & gas industry to migrate data to NAD 83 in order to:

1. Minimize risk of producing maps with multiple datums & survey grid versions unknowingly
2. Respond to new data submission and distribution requirements of regulatory agencies
3. Implement CAPP recommendation to:
 - Interchange data using NAD 83 in 2Q 2008
 - Upgrade to the new DLS survey grid version
4. Recognize that new survey data is being acquired and delivered using NAD 83

Corvelle Drives Concepts To Completion

Technical Background

Datums

To support the GPS rollout, the NAD 83 survey datum was defined to supersede NAD 27 in North America. Because NAD 27 is sufficiently accurate for geophysical and geological interpretation, the advantages of NAD 83 have been largely ignored in parts of the oil & gas industry.

Survey grid versions

While an upgrade to a newer survey grid version is not a mandatory component of a NAD 83 Data Migration project, it is worth considering because:

1. It's cheaper to perform a NAD 83 Data Migration and an upgrade to a newer survey grid version together than as separate projects.
2. Newer versions of the survey grid offer advantages; especially in a GIS environment.

Business Drivers

Canadian oil & gas producers are moving to NAD 83 to address the following business issues in their business environment:

1. Minimize the risk of producing maps with multiple datums & survey grid versions unknowingly
 - Producing maps with multiple datums creates risk of missing a typical exploration target because the difference between the datums is over 220 meters in Western Canada.
 - Producing maps with data from multiple survey grid versions creates risk of missing a typical exploration target because the difference between versions varies from 10 to 40 meters in Western Canada.
2. Respond to new data submission and distribution requirements of regulatory agencies
 - The various provincial regulatory agencies either have or are about to migrate to NAD 83.
 - The risk of forgetting to perform a conversion on data being submitted is probably not large but can occur.
3. Implement CAPP recommendation to interchange data using NAD 83 in 2Q 2008
 - Interchanging data using NAD 83 will reduce the risk of misidentifying co-ordinate data
4. Upgrade to the new DLS survey grid versions
 - Newer DLS survey grid versions, such as ATS 4.1 and STS 2.5, are more complete; leading to more accurate maps and better support for GIS functionality.
 - Newer DLS survey grid versions are available in NAD 83.

- Producing maps with data from differing survey grid versions creates risk of missing a typical exploration target because the difference between the versions ranges from 10 – 40 meters in Alberta and Saskatchewan.
5. Recognize that new survey data is being acquired and delivered using NAD 83
 - The risk of forgetting to perform a conversion to NAD 27 for data entering a company is significant because data arrives through various informal channels making it easy to forget to perform the conversion.

Typical Scope

The typical project scope of a NAD 83 Data Migration project includes the following components:

1. Databases
2. Applications
3. Data
4. Business Process

Databases

The typical project scope of a NAD 83 Data Migration project considers the following databases:

1. Data source databases:
 - DLS survey grids – newer versions are more complete
 - GIS databases – typically map layers
 - Corporate PPDM databases
 - Interaction with data vendor operated PPDM databases
 - SEG P1 database(s) – seismic navigation data
2. Active project databases such as:
 - OpenWorks, GeoFrame Stratimagic, Seisware, SeisX
 - Petrel
 - Petrosys
 - Geolog
3. Inactive project databases; particularly ones that meet the following criteria:
 - project databases with anticipated longevity
 - project databases that are likely to be re-activated
4. Document management systems – these often include co-ordinate data within the metadata
5. Legacy data:
 - Reels or cartridges of seismic SEG Y data
 - Printed & Mylar maps

For databases, the project work consists of re-loading or transforming the co-ordinate data to NAD 83.

Applications

The typical project scope of a NAD 83 Data Migration project considers the following applications:

1. Geological and geophysical interpretation
2. Mapping
3. GIS
4. G&G data browsers

For applications, the project work consists of testing functionality for NAD 83 support.

Data

The typical project scope of a NAD 83 Data Migration project considers the following data groups:

1. Well co-ordinates
2. Well directional survey
3. Seismic navigation
4. G&G interpretation
5. GIS data including the survey grid

For data groups, the project work consists of identifying and correcting data quality deficiencies.

Business Process

The typical project scope of a NAD 83 Data Migration project considers the following business processes:

1. Data gatekeeping
 - ensure incoming and outgoing data is properly identified with the correct datum and the correct survey grid version
 - provide tools to check and correct datum and survey grid version
2. Data loading & exporting
 - ensure that the processes are datum and survey grid version aware
 - add data transformation capability

For business processes, the project work consists of defining or revising and then implementing business process changes.

Approach to executing a NAD 83 Data Migration

An effective approach to executing a NAD 83 Data Migration project is to define and execute the following phases:

1. Assessment
2. Planning & Scoping
3. Pilot & Preparation
4. Execution
5. Evaluation & Review

For organizations that are unsure about the value of executing a NAD 83 Data Migration project, performing the assessment phase only will provide a useful perspective on this question.

Assessment

1. evaluate cost/benefit
2. evaluate risks
3. evaluate alternative approaches
4. consider the plans of major business partners and data suppliers
5. identify required business process changes
6. describe drivers for undertaking the project to management
7. prepare a project charter

Planning & Scoping

1. estimate data volumes by major data group
2. estimate data quality of the various in-scope:
 - data source datastores
 - project datastores
3. estimate number of applications in the application portfolio
4. assess impact of a NAD 83 data migration on the application portfolio
5. assess impact of introducing the following new survey grids to the application portfolio:
 - DLS
 - NTS
 - FPS
6. select the optimum approach for conducting the NAD 83 data migration
7. build and test required:
 - NAD 83 data migration procedures
 - dual datum operations procedures
8. determine the strategy for data quality improvements
9. build and test data quality improvement procedures
10. design required business process changes
11. produce a preliminary project plan

Pilot & Preparation

1. test the optimum approach by developing the requisite software
2. rationalize datastores
3. co-ordinate the NAD 83 data migration with affected software and data suppliers
4. test required business process changes
5. develop the communication plan
6. produce a higher-confidence project plan

Execution

1. execute data quality improvements for:
 - data source datastores
 - project datastores
2. implement new releases of applications where necessary
3. implement required business process changes
4. upgrade survey grids
5. execute the data migration
6. execute the communication plan
7. execute the orientation & training
8. execute dual datum operations
9. execute cut-over to NAD 83
10. cease dual datum operations
11. decommission NAD 27 datastores
12. decommission superseded survey grid data

Evaluation & Review

1. assess sufficiency of project scope
2. assess quality of project execution

Issues & Risks

A NAD 83 Data Migration project typically will have to address many of the following issues:

1. Lack of data quality in the NAD 27 corporate datastores
2. Lack of data quality and data integrity in the NAD 27 project datastores
3. Lack of data and software vendor readiness
4. Uneven execution of data gatekeeping processes
5. Relative vs. absolute surveying
6. Managing multiple versions of data concurrently