Disclaimer

This Report, including the data and information contained in this Report, is provided to you on an "as is" and "as available" basis at the sole discretion of the Government of Alberta and subject to the terms and conditions of use below (the "Terms and Conditions"). The Government of Alberta has not verified this Report for accuracy and does not warrant the accuracy of, or make any other warranties or representations regarding, this Report. Furthermore, updates to this Report may not be made available. Your use of any of this Report is at your sole and absolute risk.

This Report is provided to the Government of Alberta, and the Government of Alberta has obtained a license or other authorization for use of the Reports, from:

Shell Canada Energy, Chevron Canada Limited. and Marathon Oil Canada Corporation, for the Quest Project

(collectively the "Project")

Each member of the Project expressly disclaims any representation or warranty, express or implied, as to the accuracy or completeness of the material and information contained herein, and none of them shall have any liability, regardless of any negligence or fault, for any statements contained in, or for any omissions from, this Report. Under no circumstances shall the Government of Alberta or the Project be liable for any damages, claims, causes of action, losses, legal fees or expenses, or any other cost whatsoever arising out of the use of this Report or any part thereof or the use of any other data or information on this website.

Terms and Conditions of Use

Except as indicated in these Terms and Conditions, this Report and any part thereof shall not be copied, reproduced, distributed, republished, downloaded, displayed, posted or transmitted in any form or by any means, without the prior written consent of the Government of Alberta and the Project.

The Government of Alberta's intent in posting this Report is to make them available to the public for personal and non-commercial (educational) use. You may not use this Report for any other purpose. You may reproduce data and information in this Report subject to the following conditions:

- any disclaimers that appear in this Report shall be retained in their original form and applied to the data and information reproduced from this Report
- the data and information shall not be modified from its original form
- the Project shall be identified as the original source of the data and information, while this website shall be identified as the reference source, and
- the reproduction shall not be represented as an official version of the materials reproduced, nor as having been made in affiliation with or with the endorsement of the Government of Alberta or the Project

By accessing and using this Report, you agree to indemnify and hold the Government of Alberta and the Project, and their respective employees and agents, harmless from and against any and all claims, demands, actions and costs (including legal costs on a solicitor-client basis) arising out of any breach by you of these Terms and Conditions or otherwise arising out of your use or reproduction of the data and information in this Report.

Your access to and use of this Report is subject exclusively to these Terms and Conditions and any terms and conditions contained within the Report itself, all of which you shall comply with. You will not use this Report for any purpose that is unlawful or prohibited by these Terms and Conditions. You agree that any other use of this Report means you agree to be bound by these Terms and Conditions. These Terms and Conditions are subject to modification, and you agree to review them periodically for changes. If you do not accept these Terms and Conditions you agree to immediately stop accessing this Report and destroy all copies in your possession or control.

These Terms and Conditions may change at any time, and your continued use and reproduction of this Report following any changes shall be deemed to be your acceptance of such change.

If any of these Terms and Conditions should be determined to be invalid, illegal or unenforceable for any reason by any court of competent jurisdiction then the applicable provision shall be severed and the remaining provisions of these Terms and Conditions shall survive and remain in full force and effect and continue to be binding and enforceable.

These Terms and Conditions shall: (i) be governed by and construed in accordance with the laws of the province of Alberta and you hereby submit to the exclusive jurisdiction of the Alberta courts, and (ii) ensure to the benefit of, and be binding upon, the Government of Alberta and your respective successors and assigns.



Heavy Oil

Controlled Document

Quest CCS Project

Quest Project WBS Procedure

Project

Document Title

Document Number

Document Revision

Document Status

Document Type

Owner / Author

Issue Date

Expiry Date

ECCN

Security Classification

Disclosure

Revision History shown on next page

Quest CCS Project

WBS Procedure

07-0-FA-5792-0001

02

Approved.

FA-5792

Arpit Desai

2010-11-08

None

EAR 99

None

Revision History

	REVISION	STATUS	APPROVAL				
Rev.	Date Description		Originator	Reviewer	riewer Approver		
0	Feb.19 ' 2010	Issued for ESAR2	Arpit Desai	Nayef Hattab	Anita Spence		
01	May 11' 2010	Issued to EPC	Arpit Desai	Nayef Hattab	Anita Spence		
02	Nov 08' 2010	Issued for Define	Arpit Desai	Nayef Hattab	Anita Spence		
All signed originals will be retained by the UA Document Control Center and an electronic copy will be stored in Livelink							

Signatures for this revision

Date	Role	Name	Signature or electronic reference (email)
Nov 15' 2010	Originator	Arpit Desai	Actual signature
Nov 15' 2010	Reviewer	Nayef Hattab	Actual signature
Nov 15' 2010	Approver	Anita Spence	Actual signature

Summary

Add document summary	/ 1n:	to.

Keywords

Add document keywords

DCAF Authorities – N/A.

Date	Role	Name	Signature or electronic reference (email)
		Add name	Actual signature
		Add name	Actual signature
		Add name	Actual signature

TABLE OF CONTENTS

1.	PURPOSE	4
2.	SCOPE AND APPLICATION	5
3.	RESPONSIBILITY	6
4.	DEFINITIONS / ABBREVIATIONS	7
5.	PROCEDURE	8
6.	LIST OF APPENDICES	11
7.	LIST OF REFERENCES	12
8.	ATTACHMENT A – RASCI CHART ROLES & RESPONSIBILITIES	13
9.	ATTACHMENT B: CO2 CAPTURE OVERALL WBS / PCA CODING	14
10.	ATTACHMENT C – WORK BREAKDOWN STRUCTURE	15
11.	ATTACHMENT D – QUEST PLANT STRUCTURE FOR ENGINEERING TOOLS	17
12.	ATTACHMENT E – SHELL COST CONTROL TOOL - PRISM	18

1. PURPOSE

This procedure is intended to describe the framework of the Work Breakdown Structure (WBS) for the coding of the Project Cost and Financial management, Estimates, Schedules and Document Management.

The first steps in any method of Project Control should be based on how the project is broken down and thus providing a matrix baseline for:

- Budget and Cost Control
- Commitment Control
- Schedule control
- Contracting out
- Setting of single point responsibilities

It will also serve as a basis for monitoring and controlling changes to the scope of work.

The WBS is of importance in laying down the key parameters for issues such as organizational fit, definition of single point responsibility and the importance of activities that are to be carried out to achieve the targets laid down in the Project Implementation Plan.

The WBS reflects the needs of an Organizational Breakdown Structure, which in turn supports the formulation of a Responsibility Matrix. Where data in these two intersects, corresponds to the Control Accounts.

The Control Accounts support a structure for Work Packages, which are broken down into detailed resource, cost and schedule information (CTR Sheets). These costs are also identified by categories from the Cost Breakdown Structure.

The WBS will form an important link in the registry of Commitments and Actual Payments within the chosen Project ERP System (JDE, at present and plan is to move to SAP Blueprint), as each Commitment (Purchase Order or Contract) must carry a WBS Code.

All information contained in a structured WBS can be rolled up through any of the defined structures for analysis and summary reporting. Project coding structure is attached.

The WBS Matrix can also serve as the basis for establishing control documents as part of the Implementation plan; for example a Contracting-Out Matrix or Budget Estimate Matrix.

The WBS code is used to identify tasks, usually on the basis of their position in the coding structure.

One can use the WBS code to filter or sort data and information in any desired format as required.

2. SCOPE AND APPLICATION

The procedure falls under the control of the P&T - Project Services Group ().

The WBS is a hierarchical coded structure, which provides a framework for organization and progressive summarization of detail from individual activities within the project, through various predefined levels to the total project. It is derived primarily from and to reflect the geographical locations and area sub-divisions of the project.

This WBS' scope is for the project only ie as per the current schedule timeline of up to start up (2015). WBS from 2015 to 2025 monitoring period of CCS is addressed in OIP.

This procedure will be accessible from Livelink.

3. RESPONSIBILITY

The Project Services Lead shall develop the Work Breakdown Structure Hierarchy and Work Breakdown Structure Tables in consultation with the Project Manager, IM (Information Management) and project team.

Once approved, the WBS shall form an integral part of the Project Controls Plan that shall be controlled by the Project Services Lead.

The Planning Specialist shall be responsible for the coding of all Schedules in accordance with the approved WBS structure and shall ensure that all Planning & Scheduling Reports are structured accordingly.

The Cost Specialist shall be responsible for the coding of all Budget/Commitments/VOWD /Payments/Forecast in accordance with the approved WBS structure that are contained within the selected ERP environment (JDE, at present and SAP Blue print from 01 Jan 2012) in order for all payments to be correctly allocated.

The Cost Specialist shall be responsible for the coding of all Cost Reports in accordance with the approved WBS structure and shall ensure that all Cost Reports are structured accordingly.

The Project Services Lead shall control adherence to the WBS structure through the approval process of all key Planning & Cost documents.

4. **DEFINITIONS / ABBREVIATIONS**

4.1. Definitions

VOWD = Value of Work done.

4.2. Abbreviations

VOWD Value of Work Done

JDE JD Edwards (Finance/Accounting system)

FEED Front End Engineering Development

ORM Opportunity Realization Manual

WBS Work Breakdown Structure

CBS Cost Breakdown Structure

PIP Project Implementation Plan

PEP Project Execution Plan

IM Information Management

OSG Oil Sands Growth

PSG Project Services Group

PCA Project Controls Account

Livelink Information Management System

5. PROCEDURE

5.1 Work Breakdown Structure Basis

The WBS for the project shall be a combination of activity based and area based coding. The WBS is designed to present data in several different ways and to categorize activities into distinct groups.

The WBS coding and the segregation of the project shall reflect the needs of the various project functions and geographical locations for ease of use and reporting flexibility and will be common across all areas/units. The principle breakdown will be by Project/ Sub Project / Phase Coding /Plant Area and Units.

5.1.1 Project:

The main project is CO2 Quest CCS Project. Heavy Oil project portfolio structure, CO2 Quest CCS Project is coded as 07.

07 - Quest CCS Project

5.1.2 Sub Project:

CO2 Quest CCS Project is further divided into 3 sub-projects. The following sub-projects and its coding to be followed.

- 00- CO2 Venture
- 01- CO2 Capture Project
- 02- CO2 Pipeline Project
- 03- CO2 Storage Project

5.1.3 Phase Coding

The Project will be further broken down by Phase, which will be common across the Project being:

- A Identify & Access Phase
- S Select Phase
- D Define Phase
- E Execute Phase
- C Commissioning / Start-Up / Hand-Over

5.1.4 Plant Area Breakdown

The WBS will initially consist of eleven 11Area being:

- A Common
- B- HMU
- C CO2 Capture Facilities (Greenfield)
- D Utilities
- E Offsites (Brownfield)
- F- Reservoir
- G-Wells
- H-Logistics

- I − MMV
- J-Pipeline
- K Wellsite/Hook up

5.1.5 Plant Unit Coding

The Project is broken down within by Plant Units within each Plant Area and shall be coded appropriately; Unit breakdown for the project consists of four (4) Plant Units being:

- Common
- HMU Train 1 (HMU 1)
- HMU Train 2 (HMU 2)
- HMU Train 3 (HMU 3)
- HMU Common Base plant Tie ins
- HMU Common Expansion 1 Tie ins
- CO2 Regeneration
- CO2 Compression
- CO2 Dehydration Unit
- Interconnecting Piperacks
- Studies
- Injector
- Monitors
- Lease
- Access Road
- Disposal
- Surface Monitoring Kit
- Baseline MMV
- Seismic
- Surface Facilities
- Branch Pipeline
- Pipeline

Plant unit #'s for Capture part is finalized with Information Management and Scotford Operations

5.2 Work Breakdown Structure Implementation

For consistency, all Plant Area Cost Estimates shall be coded using the same WBS in order to facilitate the assignment of Costs. Additionally all Plant Area Schedules shall be coded using the same WBS in order that they can be integrated into the Overall Project Schedule.

The WBS descriptions will be consistent with the terminology used within the Project Execution Plan (PEP), Scotford complex, SAP Blueprint & the Process Flow Diagrams (PFD's) to maintain clarity across all levels of project documentation.

The WBS and it's coding structure are detailed under Attachment B – Work Breakdown Structure and reflects the structure that maps into the Project Cost Estimate, the Project Master Schedule and the subsequent levels and requirements of reporting.

No	Responsible	Action		
1	Project Controls/Service Lead	Develop the Work Breakdown Structure (WBS) Hierarchy Code and Tables in consultation with the Project Management Team (PMT) and Information Management (IM).		
2	Project Manager / Project Services Manager	Review, comments and approved the procedure and make sure adheres to Oil Sands and RDS Global Procedure requirement		
3	Planning Specialist	Make sure the schedule is being coded as per the WBS requirements and unsure that all planning and scheduling reports are structured accordingly.		
4	Cost Specialist	Responsible for the coding of all budget/VOWD/Payments/Forecast in accordance with the approved WBS structure that are contained within selected ERP environment (JDE) in order for all payments to be correctly allocated for reporting purposes.		

6. LIST OF APPENDICES

The Attachments section lists all exhibits, samples, additional reports, etc. that are include d in the procedure. Attachments are numbered sequentially, starting with A.1, A.2, and so on.

Attachment A RASCI Chart – Roles & Responsibilities

Attachment B Shell PCA coding structure
Attachment C Work Breakdown Structure

Attachment D Quest Plant Structure for Engineering Tools

Attachment E Shell cost control tool – PRISM

7. LIST OF REFERENCES

The References section lists other procedures, codes, standards, corporate directives, etc. that are mentioned in the text or that might increase the reader's understanding of the procedure. However, references should not stand in place of fully describing what the reader needs to know within the body of the procedure itself.

1. Opportunities and Project Management Guide: http://sww.shell.com/ep/toe/opmg/

2. Project Guides Website:

<u>Enterprise:Global Solutions:Joint Activities:GS - iPMS (SWW Public):-:Project Guides</u>

3. Investment Decision Manual (IDM): http://sww.shell.com/finance/authorities/

4. Cost and Planning Toolbox:

https://sww-knowledge-epe.shell.com/teamsiep/livelink.exe/Open/37165431

8. ATTACHMENT A - RASCI CHART ROLES & RESPONSIBILITIES

The above table below provides a high level overview of the roles and responsibilities of the different stakeholders within each sub-process of Reporting.

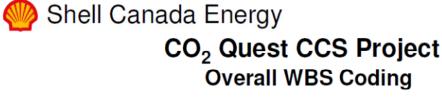
	VP Project Management	Project Services	Project Finance	Contracting & Procurement	Budget Owner	Contract Holder
Construct & Agree WBS	Inform	Responsible	Support	Support	Accountable	Support
Recording	Inform	Responsible	Support	Support	Accountable	Support
Reporting	Inform	Responsible	Support	Support	Accountable	Support
Authorizing Changes to	Inform	Responsible	Support	Support	Accountable	Support

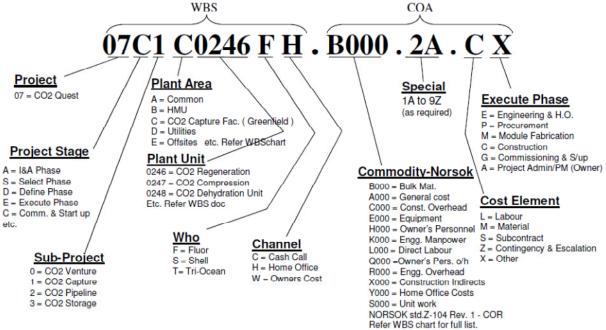
Authorizing Changes to WBS – Is the process, which formally approves the changes to WBS prior to revision and publish.

Recording – Is the process, which involves the preparation of the WBS Structure for all items of work within the approved scope of work.

Reporting – Is the assurance and disclosure of the WBS Structure to any group within the project.

9. ATTACHMENT B: CO2 QUEST CCS OVERALL WBS / PCA CODING

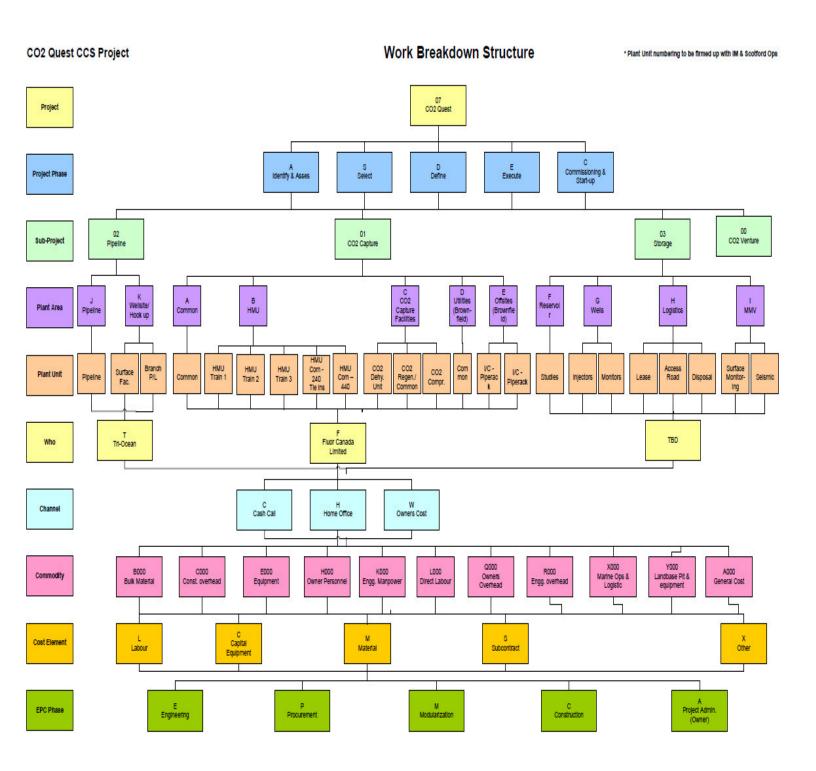




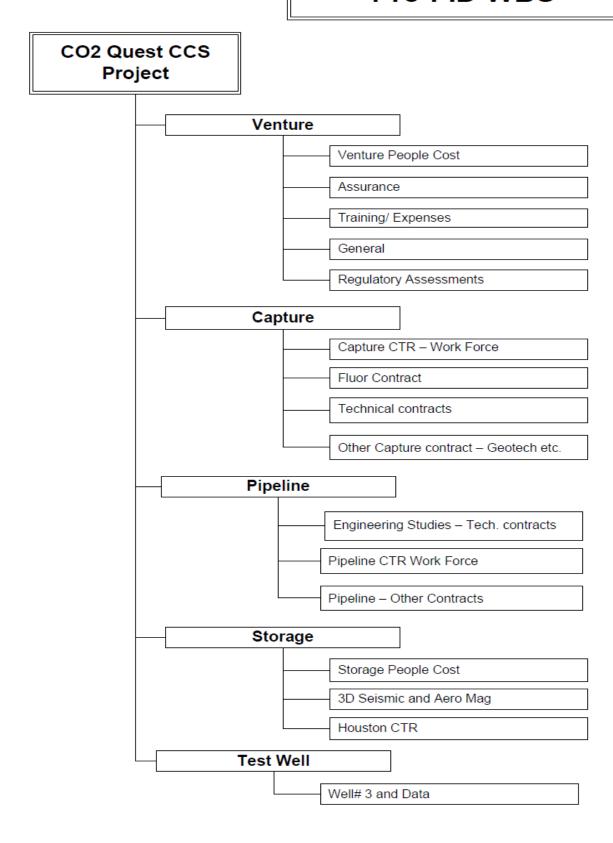
Note: Plant unit numbers for storage & pipeline to be firmed up with IM & Ops.

Engg. Documents numbers are: Project, Subproject, Plant area & Plant unit. Omit Proj. phase.

10. ATTACHMENT C - WORK BREAKDOWN STRUCTURE (CAPEX & PRE-FID):



CO2 Quest CCS Pre-FID WBS



11. ATTACHMENT D: QUEST PLANT STRUCTURE FOR ENGINEERING TOOLS:

Plant Nam e	Plant Desc.	Area Name	Area Desc.	Unit Name	Unit Desc.
	Scotford	UTILITIE			
SUG	Upgrader	S	Common	200	Common
		C02	C02 Capture Units	248	Dehydration Unit
				246	Regeneration Unit
				247	Compressor
			Hydrogen Manufacturing		
		HMU	Unit	240	HMU Common Unit – For tie ins -BP
				440	HMU Common Unit – For tie ins-Ex1
				241	Hydrogen Manufacturing Unit Train 1
				242	Hydrogen Manufacturing Unit Train 2
				441	Hydrogen Manufacturing Unit Train 3
		OFFSITES	Interconnecting Piperacks	285	Interconnecting Piperack
				485	Interconnecting Piperack

Note: 1. Requirements for description case sensitivity may change based on Engineering tool being used. I.e. PDS \SPI have description in Upper Case only. Please verify for each tool.

^{2.} Above engineering tool , plant structure is for CO2 Capture only. CO2 P/L & CO2 Storage structure with area/unit numbering will added shortly.

12. ATTACHMENT E: SHELL COST CONTROL TOOL – $PRISM^{TM}$ – REQUIREMENT – TYPICAL

Project Controls, Project Services

Outline of Requirement for Project Controls Data for PRISM from EPCM Contractors

INTRODUCTION COST AND SCHEDULE INTEGRATION

PROJECT CODING – SHELL STANDARDS

DATA SPECIFICS

Estimate

Schedule

Physical Progress

Commitments

Incurred Costs

Changes

SUMMARY AND COMMENTS

12.1. Outline of Requirement for Project Controls Data for PRISM from EPCM Contractors

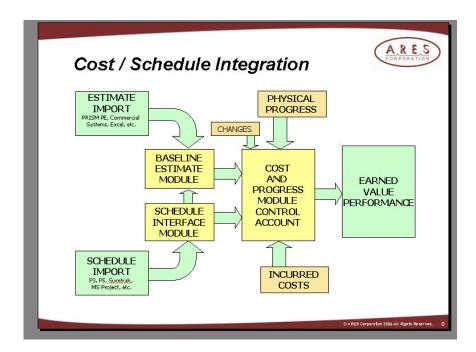
The purpose of this document is to outline the requirements for an EPCM (Engineering, Procurement, Construction Management) contractor to provide Shell Canada Energy with information necessary for project control and reporting. The relevant control data requirements are specified. This document is intended to be a guide for the generation of relevant wording in a Request for Proposal for a Shell project and for the subsequent contract.

12.2. Introduction

Project Controls is an increasingly important task and has been of some significant emphasis at Shell. New software, PRISM Project Manager and PRISM Project Estimator have been selected and implemented with Shell systems to assist with this task. Shell Project Controls personnel require specific data to enable them to perform their tasks optimally. This requirement for data is specified in this document.

12.3. Cost and Schedule Integration

The following chart illustrates the integration of data that is an important part of control tasks at Shell Canada. It indicates the integration of Estimate, Schedule, Incurred costs, Commitments, Changes, and Physical Progress data. This integration occurs at the Control Account level in PRISM Project Manager. Illustration of this integration follows:



The chart illustrates the integration of data from many sources on a project. This data may come from estimators, engineers, planners, procurement, construction, change management and finance. Many of these personnel are on the EPCM Contractors staff. To successfully integrate all of this data requires that there is a common coding structure (commonly called a Work Breakdown Structure or WBS) that can be applied to all of these facets of project control. The coding structure must enable the integration of all of the data. It is imperative to consistently apply the coding structure throughout the project. This means that those who apply the codes

must clearly understand the coding structure and everyone must therefore make similar decisions when applying it. Any decisions regarding this coding structure are to be documented and distributed to all project team members.

12.4. Project Coding - Shell Standards

The coding scheme at Shell includes codes for identifying the project and project phase, codes for breakdown of the physical location including area, plant and unit, codes for breakdown of the commodity or service required, and codes for the breakdown of the work either by work packages and /or by business entity responsible for the work. The following files illustrate the coding structure...

(insert files or references to files related to "Project Control Accounts – Coding Structure" and the multiple individual breakdown files with appropriate definitions and notes necessary to enable someone to understand the coding scheme.)

The coding structure is intended for multiple project applications at Shell. Therefore portions of this structure may be superfluous for the specific project in question. Discussion of these codes and selection of the appropriate level of coding for any specific project is fundamental to the control of a project. This discussion is necessarily part of the early days of each phase of the project. Shell personnel and the EPCM contractor will select the appropriate level of coding for each type of cost. The coding selection is principally centred on the need for various reports – both for project supervision and for project analysis. This selection of codes and coding levels will generate a list of valid control accounts for the project. All data (whether estimate, schedule, incurred costs, commitment, change or physical progress) must be related to a valid control account. The original selection of codes may need to be modified due to project changes. Any decisions regarding this coding structure are to be documented and distributed to all project team members. The personnel and systems for managing and informing others regarding code changes is an important part of best practices on a project. Create this code management system early in the project and use it diligently.

12.5. Data Specifics

All data (whether estimate, schedule, incurred, commitment, change or physical progress data) must be related to a valid control account. The following illustrates the details required from the various sources or types of data – Estimate, Schedule, Physical Progress, Incurred Costs, Commitments, and Changes.

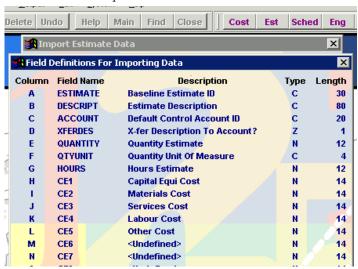
12.5.1. <u>Estimate</u>

The estimate (variously termed the baseline estimate, control estimate or original estimate) is composed of individual lines or estimate items. Each estimate item may be composed of one or

more estimate cost element such as labour or materials. Each individual estimate item and cost element must be coded to a valid control account.

12.5.1.1. Basic Data

The basic data required is illustrated as follows:



(Note that there is a potential of twenty cost elements in the estimate import. The sample above shows five cost elements defined.)

As noted above, it is possible that a single estimate item may be coded to multiple cost elements. It is possible that individual cost elements within an estimate item may coded to a separate control account. (For example: to purchase and install a compressor – the purchase may be in a different control account from the installation.) In this case additional information is needed to code the individual cost elements. This can be provided either by separating that cost element into a new individual estimate id or by coding the individual cost elements directly in PRISM. (Alternatively a file could be created for import that separates all estimate items and cost elements into a unique line of data. In this file there are not multiple cost elements per line of data. This type of file may prove easier to generate than the import illustrated above.)

12.5.1.2. Attribute Data

Most estimating packages also have attribute data in addition to the above basic data. This attribute data provides significant information about the estimate items that may not be evident in the description and the other fields noted above. Sometimes this data is part of an estimate id code. This estimate id code and any other attribute data is also important and should be imported into PRISM. This data may include but is not limited to classification of estimate item types, construction work packages, notes or comments from the estimator regarding assumptions,

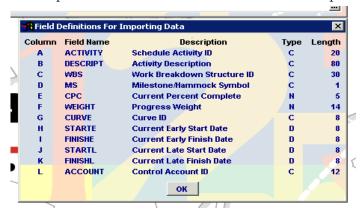
designation of equipment tag ids and other similar information. This data will be imported and occasionally updated via an Excel or other file as required.

12.5.2. Schedule

A schedule is developed from activities. Each activity within the schedule should be related to a control account or perhaps several accounts.

12.5.2.1. Basic Data

Most common scheduling programs (Primavera, Microsoft Project ..etc) can be directly imported by PRISM. This process enables PRISM to access the schedule directly and download the pertinent data. This process is done for the original (baseline) schedule and repeatedly for updated schedules (possibly with current progress). However in absence of convenient access to the scheduling program files – the data can first be exported from the scheduling software and then imported into PRISM. The schedule can be imported using the following basic fields.



Regardless of whether the data is imported directly or through an export – import, it may be most convenient to generate the linkage to control accounts directly in PRISM. This linkage is not typically part of schedule software. PRISM maintains the linkage each time the schedule is imported (except for the new schedule activities). The scheduler's input is likely to be important to this linkage process. The attribute data below may also be critical to this process.

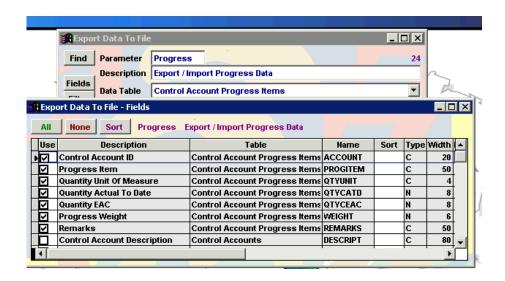
12.5.2.2. Attribute Data

Most scheduling packages also have attribute data in addition to the above basic data. This attribute data provides significant information about the activities that may not be evident in the description and the other fields noted above. Sometimes this data is part of an activity id code. This attribute data is also important and should be made available for import into PRISM. This

data may include, but is not limited to, designation of critical path, classification of activity types, notes or comments, and other similar information. This data will be imported via an Excel or other similar file as required.

12.5.3. <u>Physical Progress</u>

Physical progress is generally recorded as progress items. Progress recorded at the site (or for engineering or other activities) is reported as follows:



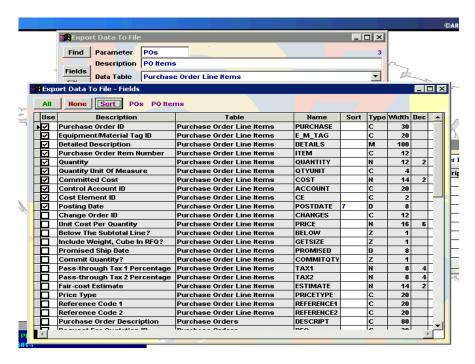
Note that the progress weight is in reference to the weight given to a progress item within the control account. The weighting must be relative to the other progress items within the control account.

12.5.4. <u>Commitments</u>

A purchase order or contract is typically composed of items or services. PRISM calls these "line items".

12.5.4.1. Basic Data

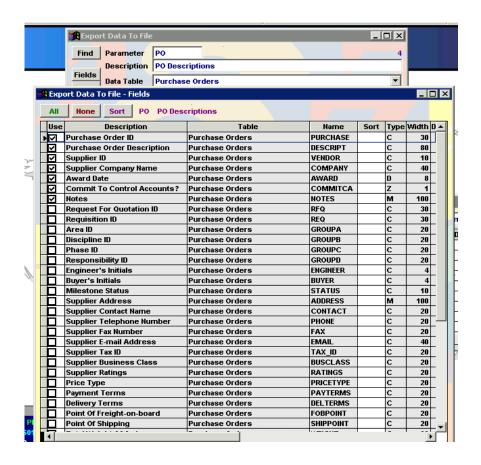
The line items on a commitment can be imported into PRISM into the "Procurement Module" as follows:



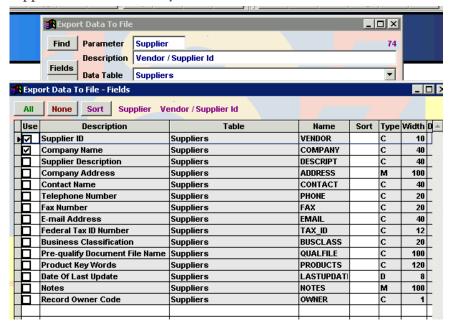
12.5.4.2.

12.5.4.3. Additional Data

Additionally the Purchase Order is associated with a supplier and other similar data. This additional data could potentially be as follows:



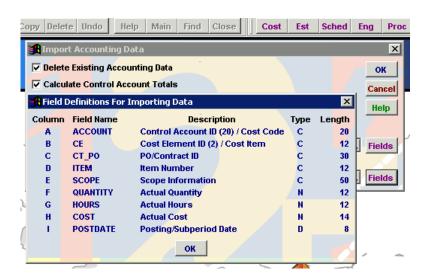
Supplier Identification may also need to be added as follows:



Note that the three lists of fields above each have checked fields and non-checked fields. All fields suggest potentially useful information. The total range of fields is designed to accommodate using PRISM as a procurement system. The checked fields indicate the fields in current use on the current project. The project team will need to determine what is most worthwhile for import into PRISM for any new projects – considering the fact that the principle management of the procurement is done by the EPCM contractor.

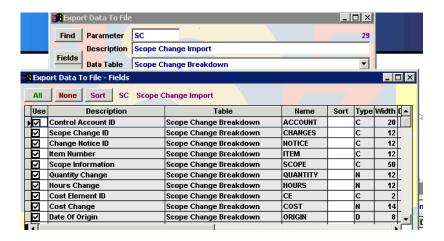
12.5.5. <u>Incurred Costs</u>

The current period incurred costs are imported into PRISM as follows:



12.5.6. Changes

The following is for the import of changes (PRISM uses the term scope change to distinguish from schedule changes):



12.6. Summary and Comments

The above document is designed to provide the EPCM contractor with information about data needed from them for import into PRISM. It is not intended to convey to the PRISM users all the information necessary to enable them to use the modules within PRISM. Additional information for the users is available in the PRISM Help and in the Shell organized training sessions.