

Feedback from Neutrino Cost Group

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DUNE Technical Board Meeting

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Your Inst Logo



Topic

- Summer Costing Exercise
 - A few examples with some commentary about format

Summer Costing

- Consortia provided 1st pass at costing Materials and Services
- Labor hours for : engineer, designer, technician, student, gs, pd, scientist
- Cost rollup at Level 2 prepared for Single Phase (Ami)
- BOE documents were also prepared
- Formats and level of backup varied widely
- Reviewers found links hard to follow
- Deferred detailed analysis until next pass and after review of the DOE scope elements (APA and CE)

DocDB index

DocDB	WBS	Description
9450	1.0	Project Office
9453	2.1	SP-TC
9456	2.2	SP-APA
9459	2.3	SP-ELE
9462	2.4	SP-PD
9465	2.8	SP-HV
9468	2.9	SP-DAQ
9471	2.10	SP-CISC
9474	3.1	DP-TC
9477	3.5	DP-CRP
9480	3.6	DP-ELE
9483	3.7	DP-PD
9486	3.8	DP-HV
9489	3.9	DP-DAQ
9492	3.10	DP-CISC

APA

DUNE Cost Book: SP-APA (WBS 2.2)

Abstract:

DUNE Cost Book for the DUNE single phase anode plane assemblies

Files in Document:

- [SP-APA BOE Supporting Information \(Assembly\)](#) (BOE_APA Assembly.docx, 784.0 kB)
- [SP-APA BOE Supporting Information \(Components Production\)](#) (BOE_APA Components Production.docx, 1.3 MB)
- [SP-APA BOE Supporting Information \(Installation\)](#) (BOE_APA Installation.docx, 664.4 kB)
- [SP-APA Supporting BOE Information \(Integration\)](#) (BOE_APA Integration.docx, 25.2 kB)
- [SP-APA Supporting BOE Information \(Production Setup\)](#) (BOE_APA Production Setup.docx, 1.2 MB)
- [SP-APA WBS with Cost Estimate](#) (DUNE SP-APA WBS v2.xlsx, 33.9 kB)

*5 Word documents
1 Excel Workbook in
WBS format; WBS
Dictionary provides
guidance about the
numbers*

CE

DUNE Cost Book: SP-ELE (WBS 2.3)

Abstract:

DUNE Cost Book for the DUNE single phase cold electronics

Files in Document:

- [Cost Summary for SP-Electronics](#) (SP-ELE-COST-SUMMARY.xlsx, 15.2 kB)
- [Supporting BOE Information](#) (SP-ELE-BOE-INFORMATION.docx, 5.7 MB)

*1 Excel spreadsheet with difficult to navigate split panes
1 7-page Word document with imbedded quotes and lots of words
with numbers in text format*

DP Electronics

DUNE Cost Book: DP-ELE (WBS 3.6)

Abstract:

DUNE Cost Book for the DUNE dual phase electronics

Files in Document:

- [DP-ELE Supporting BOE Information](#) (DP-ELE-BOE-INFORMATION.xlsx, 15.1 kB)
- [DP-ELE Supporting Costing Information](#) (DP-ELE-COSTING-INFORMATION.pdf, 338.9 kB)
- [DP-ELE WBS with Cost Estimates](#) (DUNE DP-ELE WBS.xlsx, 479.4 kB)

1 very short document on Methodology
1 WBS based spreadsheet
1 Workbook for scaling ProtoDUNE to DUNE
No vendor quotes

Photon Detectors

DUNE Cost Book: SP-PD (WBS 2.4)

Abstract:

DUNE Cost Book for the DUNE single phase photon detector

Files in Document:

- [SP-PD APA Interface Hardware Production BOE](#) (2.4.5.1.2 APA-PD Interface Hardware-Cabling-BOE.xlsx, 35.5 kB)
- [SP-PD Cable Selection BOE](#) (2.4.3.3.3 Photon Detector Cable Selection-Validation-...xlsx, 39.0 kB)
- [SP-PD Cold Signal Cable Production BOE](#) (2.4.5.3.3.1 PD Cold Signal Cable BOE-R1.xlsx, 40.1 kB)
- [SP-PD Light Collector Fabrication Tooling BOE](#) (2.4.4.1.1 Light Collector Fabrication Tooling BOE-R2.xlsx, 40.1 kB)
- [SP-PD Monitoring/Calibration Development BOE](#) (2.4.3.3.6 PDS Monitoring-Calibration Development-BOE.xlsx, 38.8 kB)
- [SP-PD Monitoring/Calibration System Production BOE](#) (2.4.5.3.6 PDS Monitoring-Calibration System-BOE.xlsx, 44.6 kB)
- [SP-PD Online Software BOE](#) (2.4.2.5.3 PD Online Software BOE-R1.xlsx, 46.2 kB)
- [SP-PD Photon Collector Module Production BOE](#) (2.4.5.1.1 PD Photon Collector Modules BOE-R2.xlsx, 36.2 kB)
- [SP-PD Readout Electronics Production BOE](#) (2.4.5.3.1.1 PD Readout Electronics BOE-Full-R1.xlsx, 119.4 kB)
- [SP-PD Signal Cable/Feedthrough Development BOE](#) (2.4.3.3.7 Signal Cable Feedthrough Selection-Validati...xlsx, 35.6 kB)

*1 WBS-based summary Excel sheet
12 separate Excel based BOE files*

*It was difficult to trace the numbers
from the separate files into the
Master; some were exact and some
didn't match (easily)*

SP-TC

DUNE Cost Book: SP-TC (WBS 2.1)

Abstract:

DUNE Cost Book for the DUNE single phase technical coordination

Files in Document:

- [BOE 2.1.1 management.xlsx](#) (BOE_2.1.1_management-v4.xlsx, 1.8 MB)
- [BOE 2.1.3 Design.xlsx](#) (BOE_2.1.3_design_worksheet-v3.xlsx, 235.6 kB)
- [BOE 2.1.4.1 DSS Production.xlsx](#)
(BOE_2.1.4.1_DSS_Production_Worksheet-v2.xlsx, 3.4 MB)
- [BOE 2.1.4.2 SP Detector Infrastructure Production.xlsx](#) (BOE_2.1.4.2-SP_Detector_Infrastructure_Production_v2.xlsx, 8.0 MB)
- [BOE 2.1.4.3 Common Detector Infrastructure production.xlsx](#)
(BOE_2.1.4.3_Common_Infrastructure_Production_v2.xlsx, 7.3 MB)
- [BOE 2.1.5.1 ITF production.xlsx](#) (BOE_2.1.5.1_ITF_Prod_worksheet-v3.xlsx, 6.6 MB)
- [BOE 2.1.5.2 Installation Production.xlsx](#)
(BOE_2.1.5.2_Installation_Production-v3.xlsx, 23.6 MB)
- [BOE 2.1.6 ITF execution.xlsx](#) (BOE 2.1.6 SP Integration Execution.xlsx, 92.3 kB)
- [BOE 2.1.7 SP Detector Installation Execution.xlsx](#) (BOE_2.1.7_SP_Detector_Installationv2.xlsx, 109.1 kB)
- [Future To-Do list](#) (BOE-ToDO-List-v9.xlsx, 44.4 kB)
- [Labor Overview spreadsheet](#) (WBS-2.1 Technical Coordination (SP-DP TPC)v7.xlsx, 248.2 kB)

ment

- [TC WBS with Cost Estimates](#) (DUNE TC WBS.xlsx, 486.4 kB)

*Lots of separate Workbooks;
Each workbook has lots of Worksheets;
Lot's of detail; many vendor quotes*

SP HV

DUNE Cost Book: SP-HV (WBS 2.8)

Abstract:

DUNE Cost Book for the DUNE single phase high voltage

Files in Document:

- [SP-HV WBS with Cost Estimate](#) (DUNE SP-HV WBS.xlsx, 403.9 kB)

All in one excel file

BOE's entered on separate Worksheets of the Workbook

This is a simple format for reviewers; it allows for easy passing of numbers from detail to summary.

This is also a pretty easy system compared to some of the others....

CISC

DUNE Cost Book: SP-CISC (WBS 2.10)

Abstract:

DUNE Cost Book for the DUNE single phase cryogenic instrumentation and slow controls

Files in Document:

- [CISC Supporting BOE Information](#) (CISC-BOE-Information-v2.xlsx, 872.0 kB)
- [CISC WBS with Cost Estimates](#) (DUNE CISC WBS.xlsx, 545.1 kB)

*It was difficult to link the information between the BOE Workbook with the WBS format
BOE format was simple and easy to follow, but contains no validation data.*

General comment

- The WBS based workbook format is difficult to navigate
- Early in the process I thought it would be easy to use, but there are so many lines in it, not associated with costing that it is hard to find numbers and total costs, once the file is opened
 - Columns are too wide and one needs to scroll around to find things

Summary

- There is too much variation in the way the Consortia have prepared the documents (Summer versions).
- Some were easier to follow than others.
- Not clear that uniform assumptions about how labor is counted were used (i.e. trying to incorporate efficiency and other factors); need an assumptions document; don't try to include \$'s with labor
- The APA and CE were improved for the October Director's review – but still each was quite different from the other...
- You need to use a uniform, consistent format for each System
- The NCG is not going to prescribe that format – you need to determine that yourselves based on what makes your estimates easy to navigate.
- Once you have decided on a format, we are happy to do a preliminary test drive to give you some feedback on how to improve.