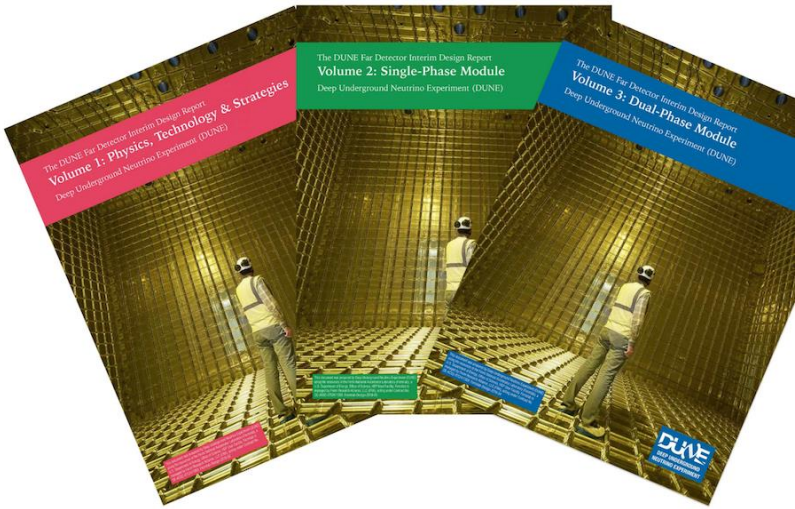
TDR Plan and Schedule

- Tim Bolton and Sam Zeller
- LBNC Review
- December 8, 2018

The TDR plan:



- Start from IDR.
- Address LBNC concerns.
- Update, especially using ProtoDUNE.
- Incorporate more project-level information.

LBNC's big two IDR issues

- Requirements: not there
  - New scheme:
  - Small set of 5 key design specifications, with ~25 more EB-held central design specifications.
  - Physics TDR links key design specifications set to physics goals.
  - Detector consortia show a design specifications solution set that meets physics goals.
  - Fixed format tables.
  - Central management/version control.
- Length: too long
  - New scheme:
  - Break TDR and CDRs into readable stand-alone volumes.
  - Add Overview volume: collection of executive summaries.
  - Expanded Technical Coordination volume: one-stop shopping for all matters project.
  - Send all components to LBNC early at **2nd draft stage**.
  - Hold the line on chapter length.

Requirements→Specifications

- Tiered list of detector specifications:
- Top level: five key detector specifications.
  - Physics driven specifications and goals (spec., goal)
  - Drift field (>250 V/cm, 500 V/cm), electron lifetime (>3 ms, 10ms), electronic system noise (<1000 enc, ALARA), light yield (>0.5 PE/MeV, 5 PE/MeV), photon-based timing (<1 μs,100 ns)
- Level 2: central detector specifications held by the Technical Coordinator and ratified by the EB. (Note: currently mostly SP, DP additions expected.)
  - Comprise a non-unique working solution that meets physics goals.
  - Example: E-field non-uniformity.
- Level 3: consortium owned specifications.
  - Comprise a non-unique implementation that meets physics goals.
  - Example: environmental light exposure for PDS units.

Proposed Specifications Table format

Name	Primary Text	Value	Value (LaTeX)	Goal	Rationale (brief)	Validation (brief)
Descriptive name of the specification (max 100 characters including spaces) (REQUIRED)	**Full text of the req/specification. Example: The DAQ shall provide (REQUIRED)**	**Specification value: number plus units (as needed) (REQUIRED)**	**Specification value: number plus units (as needed) (REQUIRED)**	**Number plus units (as needed)**	**Max 120 characters (REQUIRED)**	**Max 120 characters (REQUIRED)**
Minimum drift field	The drift field in the TPC shall be greater than 250 V/cm, with a goal of 500 V/cm.	>250 V/cm (goal 500 V/cm)	$>$\,\SI{250}{ V/cm}	$>$\,\SI{500}{ V/cm}	Lessens impacts of e-Ar recombination, e-lifetime, e- diffusion and space charge.	ProtoDUNE
Remainder of Level 1 key parameters block						
Level 2 selected central parameters block						
Level 3 consortium parameters block.						

- Long form version of Table will be available via a link to DocDB.

TDR Structure

- Stand alone volumes with different functions
  - Overview: The DUNE big picture. DUNE for program managers, science committee staffs, new reviewers and collaborators.
  - Physics: The DUNE physics case and key detector parameters from physics.
  - SP, DP volumes: Implementing the DUNE physics program via the SP and DP technologies.
  - Technical coordination: Management, facilities, and methodologies; DUNE for project reviewers.
- Organizational status
  - All editors signed on and engaged.
  - Technical support team in place: Corwin, DeMuth, Heavey (lead), Ransom,Viren.

TDR Volumes I,II

I. Overview: DUNE in one volume.

A. Executive summary (Blucher, Soldner-Rembold)

B. Physics summary (Urheim, de Roeck)

C. SP module summary (Evans)

D. DP module summary (Autiero)

E. Computing summary (Norman, Schellman) ***

F. Near detector summary. (Kordosky, Manly) ***

G. Technical Coordination summary (Kettell)

II. Physics: DUNE science and detector impacts

(See talk by Urheim)

*** Summaries only. Computing and Near Detector CDRs come later in 2019.

TDR volumes III

III. Single Phase Detector: DUNE science implementation

A. Executive summary (Evans)

B. APA (Schmitz)

C. High voltage (Plunkett)

D. Photon detector system (Wilson)

E. Cold electronics (Mooney)

F. DAQ (Karagiorgi, Viren)

G. Calibration (Gollapinni,Mahn)

H. CISC (Horton-Smith, Palomares)

I. Integration and Installation (Stewart)

TDR volume IV

III. Dual Phase Detector: DUNE science implementation

A. Executive summary (Autiero)

B. CRP (Duchesneau, Mazzucato)

C. High voltage (Pietropaolo,Yu)

D. Photon detector system (Bilki, Sorel)

E. Electronics (Dawson, Galymov)

F. DAQ (Karagiorgi, Viren)

G. Calibration (Gollapinni,Mahn)

H. CISC (Horton-Smith, Palomares)

I. Integration and Installation (Resnati)

TDR Volume V

V. Technical coordination: all project-like functions and methodologies

A. Executive Summary (James)

B. Project functions (Kettell)

C. Internal reviews (Kettell)

D. Integration (project engineers)

E. Facilities (Kettell)

F. LBNF Interfaces (project engineers)

G. Facility management (Miller)

H. QA (DUNE QA manager)

I. ESH (Andrews)

Details on 2nd-Drafts-to-LBNC

- More time for review and feedback; less to review in each batch.
- Working solution: Deliver batches of TDR chapters at second draft state in small batches at staggered times.
- Final complete submission moves back to summer 2019.

Proposed Working schedule

Consortium	1st draft	2nd draft	To LBNC
SP-HV	2-Nov-18	7-Dec-18	21-Dec-18
SP-APA	2-Nov-18	14-Dec-18	21-Dec-18
SP-DAQ	12-Nov-18	14-Dec-18	21-Dec-18
SP-PDS	7-Dec-18	11-Jan-19	25-Jan-19
SP-CISC	30-Nov-18	11-Jan-19	25-Jan-19
TC	7-Dec-18	11-Jan-19	25-Jan-19
PHYSICS	30-Nov-18	11-Jan-19	25-Jan-19
SP-CE	14-Dec-18	8-Feb-19	22-Feb-19
DP-Electronics	14-Dec-18	8-Feb-19	22-Feb-19
Computing Exec Summary	14-Dec-18	8-Feb-19	22-Feb-19
DP-HV	1-Feb-19	1-Mar-19	29-Mar-19
SP-IIC	1-Feb-19	1-Mar-19	29-Mar-19

Consortium	1st draft	2nd draft	To LBNC
DP-PDS	1-Mar-19	5-Apr-19	26-Apr-19
SP-Calibration	1-Mar-19	5-Apr-19	26-Apr-19
SP-Exec Summary	1-Mar-19	5-Apr-19	26-Apr-19
ND-Exec Summary	1-Mar-19	5-Apr-19	26-Apr-19
DP-IIC	5-Apr-19	10-May-19	31-May-19
DP-DAQ	5-Apr-19	10-May-19	31-May-19
DP-CISC	5-Apr-19	10-May-19	31-May-19
DP-Calibration	10-May-19	7-Jun-19	28-Jun-19
DP-CRP	10-May-19	7-Jun-19	28-Jun-19
DP-Exec Summary	10-May-19	7-Jun-19	28-Jun-19
Overall Exec Summary	10-May-19	7-Jun-19	28-Jun-19
TDR Final			26-Jul-19

Project functions

- Methodologies for specifications, cost, schedule, risk, interface, ESH, and QA/QC will be described in the technical coordination volume.
- Most project data will be in DocDB.
- Working groups and consortia will summarize information in tables, with explanatory text added where needed, and DocDB reference links provided for more detail.

Editors' Summary and Wish List

- We have launched! Batch 1 (APA, SP DAQ, SP HV) is at second draft preparation stage with scheduled Dec. 21, 2018 submission to LBNC. Batch 2 (SP CISC, SP PDS, TC, Physics) is at first draft internal review stage.
- Our requests to you:
  - Concur with overall architecture.
  - Concur with requirements→specifications scheme.
  - Concur with staged second draft submission scheme.
  - Concur with schedule.
  - Agree to schedule return of second drafts to DUNE for revision.
  - Please don't treat second drafts as final drafts.