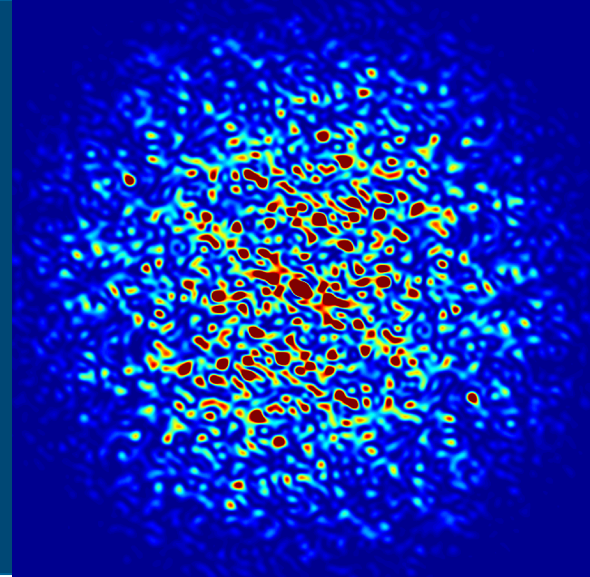


# June APS Upgrade Forum



**Jim Kerby**  
Project Manager

June 14, 2018

# Safety

## Suspension of hazardous laser work at the APS

As a result of a laser incident at the Dynamic Compression Sector (Sector 35) where two individuals had a potential laser eye exposure caused by looking at the end of laser fiber fed by an IR laser, all hazardous laser work (Class 3b and 4, including User Mode Only operations) at the APS has been paused. In order to restart laser work, Standard Operating Procedures and Laser Operating Permits have to be reviewed and work re-authorized by the Argonne Laser Safety Officer.

Stephen

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# Safety

Exercise our “PAUSE WORK” responsibility

*“Wait, are you sure it’s ok to do this?”*

*“Wait, am I sure it’s ok to do this?”*

*A thorough discussion, AND --even at the end --a little doubt typically leads to a better solution*



# Safety

## Always Practicing Safety

### When is the Work Done?

This past week, I went to look at an upcoming work activity to discuss an upcoming work task. When I looked around the area, I commented on having sufficient space to do the work. I was assured that things were going to be moved and the area prepared prior to starting the task being discussed.

Cleaning up, reorganizing the work area and putting away tools and equipment were not activities that are within the scope of the work we were discussing, rather leftovers from previous work activities.

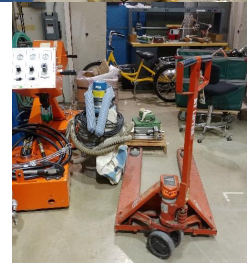
There is a good deal of planning, scheduling, documentation and discussion required in order to get the work activity started. Start of work is tied to management authorization of the work commencement, starting with a pre-job briefing to review what will be done, who is responsible, and the hazards and controls to be followed along with potential upset conditions that may occur with a reminder to pause, suspend or stop work as needed.

Once the work activities start, there are periodical oversight reviews conducted, along with discussions as the activities transition from one step to the next to determine the progress and status of the completion of the work activity.

To define when work is done varies by the position and role of the person you ask. To some it will be when the individual task is completed without the closeout activities. To another, it is when they have completed their subset of the overall work activity. To a manager, it may be when the milestone or goal has been met, even if the work activity is still ongoing.

Regardless of the perspective, for any work activity to be completed the following must be done:

- All tasks for the defined scope of work are completed
- All tools and equipment are put away
- Materials and supplies left over from the work are put away, including those items we salvage or intend to use later
- Waste materials are properly disposed of, or documentation completed and waste properly stored in designated areas
- The work area is cleaner and more organized than when you started
- Work activity specific postings are taken down or removed
- A post-job briefing has been completed with lessons learned documented
- If required, the work control document or procedure revision process started



Finish the Job.

Clean up...Put things away, throw things away, or recycle.

Make sure signage is consistent with the current state of affairs.

Think...what could we do better next time? Write it down!

Do not leave 'traps' for the next person who is walking in to an area or performing that job!

# CD-2 Timeline

June 13 – now...

- PCRs – we will go with the plan as of July
- Risks –review and update what is in the registry if you have not already
- Recommendations – review and update
- FULL EVMS starts this month

August ~9-10-13 – Dry runs of talks (individual exact dates tbd, we will work to the extent possible w/ schedules)

August 14 – All Files posted for review

**August 21- 23 – Director’s Review (DOE PM ICE/ICR starts ~same time, mostly not at ANL)**

Week of September 17 -- Dry runs as needed

September 26 -- All Files posted for review

**October 10-12 – OPA Review**

Director’s and OPA reviews are expected to be 2.5 day reviews, with plenaries and ~8-9 parallel breakout sessions, with ~ the last day being Q&A and report writing

# CD-2 Review

- Scope Baseline: Is the project scope definition sufficiently mature to establish a performance baseline? Do the Key Performance Parameters (KPPs) adequately define the technical performance required from the project to meet the Mission Need? Is the Work Breakdown Structure (WBS) dictionary sufficiently developed to adequately define the project scope and deliverables?
- Cost Baseline: Is the engineering design and the associated cost estimate sufficiently mature to establish a cost performance baseline? Does the cost estimate include adequate contingency to ensure project success?
- Schedule Baseline: Does the integrated project schedule represent a credible plan to deliver the project scope within the planned costs, subject to the assumed funding profile, and with adequate schedule contingency?
- Management: Does the project management team possess the knowledge and skills to deliver the project scope within the proposed cost and schedule baselines? Do they understand the project risks and have adequate contingency to address them? Has their performance to date, as evidenced by the progress on LLP, met expectations? Is the plan for retaining and integrating the LLP performance into the established baseline sound? Have they met all the requirements for CD-2 approval
- ES&H: Are the ES&H/QA requirements being properly addressed for this project stage?
- Recommendations: Have previous recommendations been appropriately addressed?

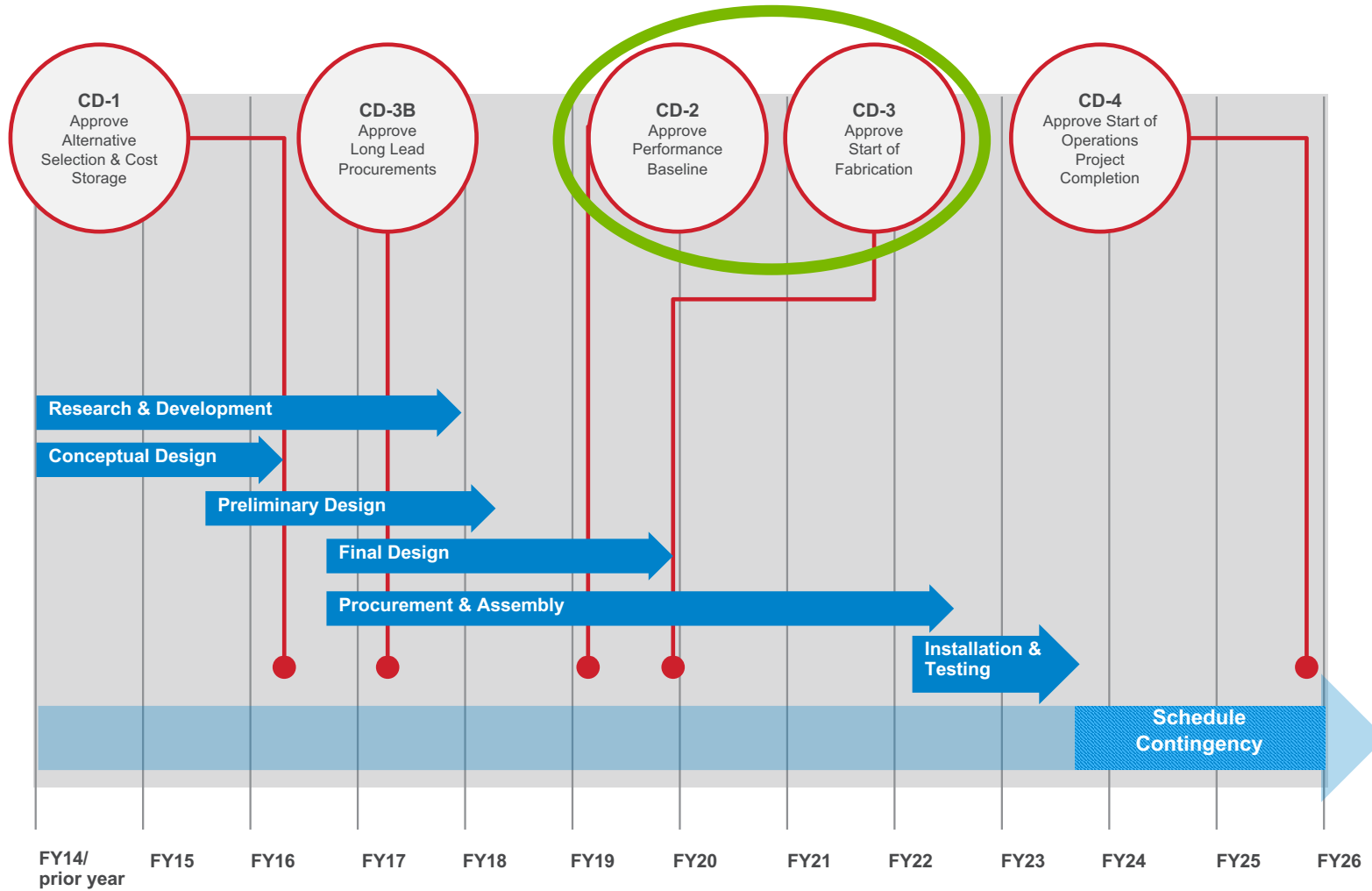
# CD-2 Review

Key Performance Parameter	Thresholds (Performance Deliverable)	Objectives
Storage Ring Energy	> 5.7 GeV, with systems installed for 6 GeV operation	6 GeV
Beam Current	> 25 mA in top-up with systems installed for 200 mA operation	200 mA
Horizontal Emittance	< 130 pm-rad at 25 mA	< 42 pm-rad at 200 mA
Brightness @ 20 keV <sup>1</sup>	> 1 x 10 <sup>20</sup>	> 1 x 10 <sup>22</sup>
Brightness @ 65 keV <sup>2</sup>	> 1 x 10 <sup>19</sup>	> 2 x 10 <sup>21</sup>
APS-U (or Feature) Beamlines Transitioned to Operations	5	≥ 6

We will propose a TPC of \$815M for the APS Upgrade. This should allow us to more fully develop and deliver the science capabilities of the facility—APS 2025 if you will.

Funding status: **FY17: 42.5M FY18: 93M**  
 FY19: *60 PBR / 130 House / 140 Senate*  
 FY20: 150M FY21: 159.8M FY22-23: 131.2M

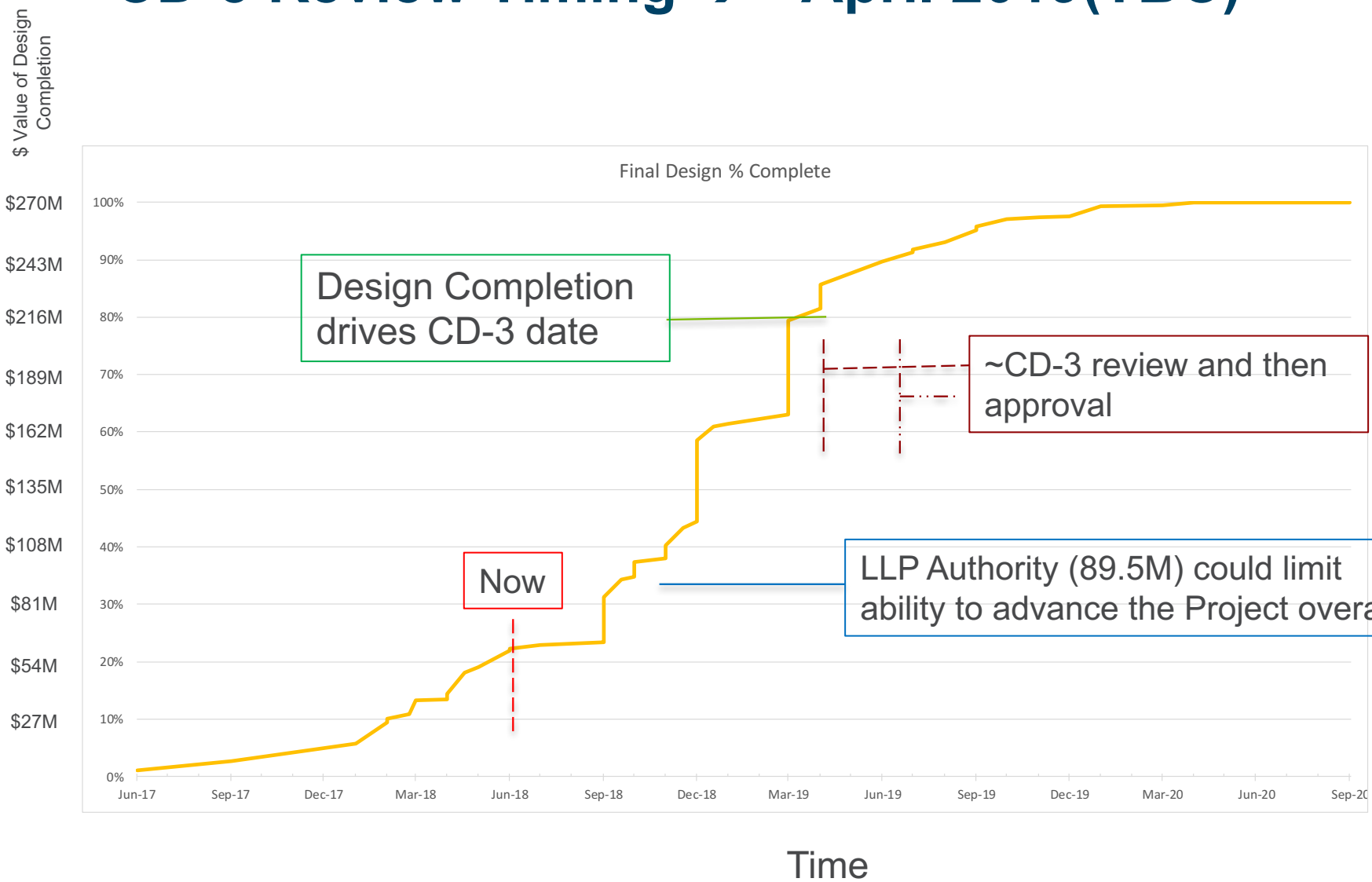
# And Beyond!





# CD-3 Review Timing → ~April 2019(TBC)

\$ value of procurements, and % of those designs through final design



# Summary

We live in very exciting times! After a long 'front porch'...the APS-U is becoming real...and in conjunction with Operations, will recreate the APS by the middle of the 2020s.

Congress and the Administration are supportive and advancing the APS Upgrade...quickly!

It's a very busy time...your concerted efforts are welcome and very much needed...Thank You!

Questions?

# Safety

“Diversity is being invited to the party. Inclusion is being asked to dance.”

## Inclusion (Merriam – Webster)

- **1:** the act of including : the state of being included
- **2:** something that is included: such as
  - **a** : a gaseous, liquid, or solid foreign body enclosed in a mass (as of a mineral)
  - **b** : a passive usually temporary product of cell activity (such as a starch grain) within the cytoplasm or nucleus
- **3:** a relation between two classes that exists when all members of the first are also members of the second — compare membership 3
- **4:** the act or practice of including students with disabilities in regular school classes
- — **inclusionary**
- play \in-'klü-zhə-ner-ē\ *adjective*

I strongly encourage ALL of us to create a respectful, inclusionary environment.

When working in groups...make sure everyone has the chance to dance.

# On executing the LLPs

We have to execute the LLPs in a rational and transparent manner

- Designs have to be documented and complete (→ our reviews)
- We have to plan how we will procure (design and build? build to print?)
- We have to plan how we will accept (acceptance criteria and tests)
- Typical bid evaluation is 'best value' (do not need to be low bidder)

Readiness is reported through a Procurement Readiness Checklist to Federal Project Director

- Progress is directly tracked and reported (EVMS)

# LLPs

- *Second phase of Bunch Lengthening Cavity and Cryomodule*
- *Eight pole Corrector Magnets*
- *Beamline Optics and Stability Components*
- **Q3 and Q6 quadrupole magnets**
- **Unipolar Power Supply Components**
- High Heat Load Front End Components (Glidcop based)
- S1, S2, and S3 sextupole magnets
- **RF BPM Components (Relay Racks)**
- **ASL beamline (Enclosures) + Technical Equipment**
- X-ray Beam Position Monitor Components (GlidCop based)
- Magnetic Structures for Planar Undulators
- ASL Canted Undulator Front End
- Canted Undulator Front End Components (Glidcop based)
- Bunch Lengthening System Cryoplant
- **Q4 and Q5 magnet contracts**
- High Voltage Pulsers
- Insertion Device Vacuum Chambers
- Pneumatics and Equipment Protection System for High Heat Load Front Ends
- DLM A Plinth
- Fast Corrector Chambers
- Septum magnet

On going, assumed a 20M FY18 budget

Adds with the 93M FY18 actual budget

Continued execution of the LLPs is extremely important

- Reduces risk to the project
- Delivers on project schedule
- Locks in prices (reduces uncertainty captured in contingency need)
- Demonstrates our ability to effectively use funds to our sponsors

# On executing the LLPs

The Procurement Readiness Checklist includes sign offs for

- |                                   |   |   |
|-----------------------------------|---|---|
| 1. Functional Requirements        | } | Is it technically ready and are interfaces to neighbors understood? |
| 2. Interface Documents            |   |   |
| 3. Engineering Specifications     |   |   |
| 4. Technical Review Completion    |   |   |
| 5. Safety Review Complete         | } | Do we know how we will accept it?                                   |
| 6. Acceptance Criteria Understood |   |   |
| 7. Vendors Evaluated              | } | Do we have a rational set of vendors to bid the job?                |
| 8. Procurement Ready to Proceed   | } | Are all of the above done and do we have the money?                 |

Items 1 through 6 are part of the Final Design Review or Production Readiness Review. → See Tom F. (Mark B.) for clarifications w/ your APM.

Item 7 (and this form in general) is owned by Tom B.

Item 8 is my signature. Chance of getting this without items 1-7 complete is miniscule.

# On executing the LLPs

For any non-catalog item, we then need:

- A Statement of Work (→ Elmie)
- A released drawing package
- ANL-407 (excel version → Tom B)

This list can be tailored (shortened) if appropriate

ASK...there is a reason there are names on these pages!

SOW for a Double-Crystal/Multilayer Monochromator  
January 30, 2018

**Table of Contents**

<b>1</b>	<b>Scope and Introduction.....</b>	<b>5</b>
1.1	Scope .....	5
1.2	Introduction .....	5
1.3	Beamline Description.....	6
1.4	Components and Tasks Provided by APS.....	8
1.5	Schedule.....	9
1.6	Reports and Documentation.....	10
1.6.1	Initial Project Meeting .....	10
1.6.2	Preliminary Design Review .....	10
1.6.3	Final Design Review.....	10
1.6.4	Monthly Progress Reports .....	11
1.6.5	Shipping of device from CONTRACTOR to APS.....	11
1.6.6	Final Project Closeout .....	11
1.7	Warranty.....	11
<b>2</b>	<b>DCMM Technical Description.....</b>	<b>12</b>
2.1	Design Concept.....	12
2.2	$\theta_B$ Primary Bragg Rotation.....	14
2.3	$Y_T$ Translation.....	14
2.4	$X_T$ Translation.....	14
2.5	First Crystal/multilayer .....	15
2.6	Second Crystal/multilayer.....	15
2.7	Capacitive Sensors.....	16
2.8	Canted Beam Clearance.....	16
2.9	DCMM Crystal protection.....	16
<b>3</b>	<b>Specifications .....</b>	<b>17</b>
3.1	DCMM specifications.....	17
3.2	Tolerances.....	18
3.3	First and Second Crystals/Multilayer .....	18
3.4	X-ray Beam Specifications.....	19
3.5	Motions and Controls.....	19
3.6	Cooling.....	20
3.7	DCMM Compton Shielding.....	22

SOW for a Double-Crystal/Multilayer Monochromator  
January 30, 2018

3.8	Support Structure.....	24
3.9	Space Requirements.....	24
3.10	Vacuum and Ports.....	24
3.11	Summary of differences between the two monochromators.....	26
<b>4</b>	<b>Quality Assurance and Inspection.....</b>	<b>26</b>
4.1	Quality Assurance .....	26
4.2	Inspection and Factory Acceptance Tests (FAT).....	26
4.3	Test Results and Certificates.....	27
<b>5</b>	<b>Packaging and Shipping.....</b>	<b>28</b>
5.1	Packing and Shipping.....	28
<b>6</b>	<b>APS DCMM Acceptance Tests .....</b>	<b>28</b>
6.1	Crystal Metrology .....	29
6.2	Parasitic Motions .....	30
6.3	Vibrations.....	31
6.4	Vacuum Integrity .....	31
<b>7</b>	<b>Installation, Alignment and Testing .....</b>	<b>31</b>
7.1	On-Site Assembly and Installation .....	31
7.2	Alignment Relative to the X-ray Beam.....	32
7.3	Mechanical Testing.....	32
<b>8</b>	<b>Final Acceptance Tests .....</b>	<b>32</b>
<b>9</b>	<b>Coordinates.....</b>	<b>32</b>
<b>References .....</b>		<b>34</b>
<b>10</b>	<b>Attachments.....</b>	<b>34</b>