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Date Ref	Review	Item	Concern/Recommendation	Responsibility / WBS or Job	Comment/Action	Current Status	Status
200908-01	August 2009 Peer Review	Peer-01	Need to append GRD to include future option of 10s pulses at reduced performance. This could impact protection systems and data acquisition.	Strykowsky	Out of Scope	Out of Scope - Design is based on signed version of GRD	CLOSED
200908-02	August 2009 Peer Review	Peer-02	NSTX-U pulse length will increase 5x. Increasing memory of CAMAC likely does not increase speed of data read-out and archiving. Should consider options that can return data as fast as we presently archive instead of 5x longer.	Sichta		Additional CAMAC replacements have been included in baseline estimate	CLOSED
200908-03	August 2009 Peer Review	Peer-03	For Kaita may need / want more TC-s in diverter region due to higher power load to diverter. Need to make sure have enough organ pipes for additional leads.	Kaita	Consider reducing number of CHI connections on top (use for bakeout only) On bottom conserve organ pipes when increasing size of pedestal structure	Designer has verified that there are enough TCs in the upper and Lower diverter regions (eight in each) to address the concern raised by J. Menard.	CLOSED
200908-04	August 2009 Peer Review	Peer-04	Recent CHI experiments indicate fast response (high slew rate) of absorber coils is very important. The PF1BU and PF1CU coils may now be too inductive to use TRANSREX supplies. Need to assess if SPA or other supply is needed, or if coil needs to be redesigned.	Ramakrishnan	Coils may not be able to be powered by supplies that are planned. Need to verify that they are suitable for the PS.		CLOSED
200908-05	August 2009 Peer Review	Peer-05	Support structure for PF3,4,5 system adds significant structure and many interferences to NSTX. Need to find out what is required to not modify PF3 supports, and to use vessel as coil support.	Titus	Next step look at operating cases and determine if PF3 support can be removed.	Closed - the Preliminary Design has been simplified and interferences eliminated	CLOSED
200908-06	August 2009 Peer Review	Peer-06	Need to look at forces on PF1A,B,C including plasma current (use Woolley models of plasma current distribution) Is this effect important?	Titus	An accurate simplified plasma model needs to be used	Analysis of these coils has been completed and have been found to be acceptable.	CLOSED
200908-07	August 2009 Peer Review	Peer-07	Diverter surfaces could get quite hot. Need thermal analysis of temp. in o-ring region to ensure o-rings wont melt, or spec. cooling requirement	Brooks	Myatt and Brooks working on analysis	Closed – Thermal analysis has been completed and it was determined that additional cooling will be required in that area to protect the o-rings. Plans to provide additional cooling have been added to the NSTXU design.	CLOSED
200908-08	August 2009 Peer Review	Peer-08	May need some gas injection ports on bottom of CS for CHI and diverter detachment. Contact Raman and Soukhanovskiii	Chrzanowski		Blanchard spoke with both Roger and Vlad prior to the design review and they both agreed that the present lower dome gas injection system with four inlet tubes at 90 degrees apart is not used and will not be required for the upgrade. The lower diverter gas injection system with a single inlet tube comes in from an outer vacuum vessel port. This system will be preserved for the NSTX upgrade but because it is on the outer vacuum vessel, and not the center stack, no changes are necessary on this system.	CLOSED
200908-09	August 2009 Peer Review	Peer-09	All analysis should be using the Len Myatt adopted 9 worst case load scenarios	Titus	Good idea in the long run. But premature for now.	(10/5/10) This should be closed. We are doing all of the 96 scenarios or doing worst of 96 scenarios.	CLOSED
200908-10	August 2009 Peer Review	Peer-10	Move to go to Cu-Zr is based on one hot spot. Stress that is from an idealized model. If Cu-ZR cost is high then re-examine this model. Place in Global model that does not have idealized constraints. Also check field calcs (hand)	Willard		Loads required use of Cu Zr in flex	CLOSED

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200908-11	August 2009 Peer Review	Peer-11	Look at how many cycles have already been performed on components -> get accurate count. Then specify how many new/ extra cycles are needed. Is it 30,000 / 3,000 more or 60k?	Titus	Need to find to correct criteria. Use equiv. full field shots.	(10/5/10) Fatigue qualification is based on analysis, and on in-service inspection. On new components for the upgrade we calculate fatigue life and check to make sure it complies with the NSTX structural criteria document. Analysis is also being done to qualify old components, but we are relying on in-service inspection of these parts and are compiling a list of components that require periodic inspection as a part of normal down times for the experiment.	CLOSED
200908-12	August 2009 Peer Review	Peer-12	Use real world geometry for existing component where possible in all analysis	Titus	Will look into incorporating the CMM data from the vessel to the degree possible	Where possible and existing component data is being incorporated. For example actual welded condition of the ribs was used to qualify the PF support ribs	CLOSED
200908-13	August 2009 Peer Review	Peer-13	See if analysis of existing TF structure matches what is observed in field. If off by a lot examine why. You may be under / over estimating here.	Dudek	OTF leg deflections should be measured	Closed- Data from previous runs (run set #9 (beginning with shot 117514) through run set #11 (ending with shot 118913). It was connected via extension fiber #30 to FISO channel #4.) has been located and data indicates the deflections are similar to those calculated. 4/15/11 – Note: New OTF leg deflection measurements will be obtained by using fiber optic displacement sensors. This will be done once NSTX starts up in June 2011. To be completed by 7/15/11.	CLOSED
200908-14	August 2009 Peer Review	Peer-14	OH conductor- Consider 4 in hand (or 3) vs. 2 in hand to limit or eliminate inline brazes	Chrzanowski	Will consider	Plan on using a continuous OH conductor unless the cost is unacceptable. Contingency plan would be to go back to brazes.	CLOSED
200908-15	August 2009 Peer Review	Peer-15	Advertised doubling of TF field is misleading. One suspects that there is an unstated underlying technical reason.	Neumeyer		Corrected in presentation materials	CLOSED
200908-16	August 2009 Peer Review	Peer-16	Stir Welding: 1. When will it be qualified? 2. If this fails, what are alternatives? 3. Is qualification of at least one of those (alternatives) in the plan	Chrzanowski	Need to identify backup plan to deal with this risk - E-beam weld? Braze?	E-BEAM weld is the backup. Friction stir with the planned alloy is underway and results are expected soon. Results will be available for PDR.	CLOSED
200908-17	August 2009 Peer Review	Peer-17	Tensioning, verification, and monitoring of TF bolted connection - Monitor 1. Bolt Tension 2. Voltage Drop	Chrzanowski	Voltage drop instrumentation is planned, Custom Bolt tensioner use needs to be evaluated with the planned design.	Baseline plan is now to use Superbolts. Instrumentation of the joints is also in the baseline plan	CLOSED
200908-18	August 2009 Peer Review	Peer-18	Cold OH - Hot TF could lead to vertical tension in OH stack due to Friction or interference at interface with TF	Chrzanowski	Consider performing tests on the half lap taped slip plane. Consider machining the OD of the TF Grnd wall. Consider looking at the existing tension tube slip plane to determine effectiveness	A gap is being provided Avapour during winding. The material can be washed out after winding and curing. Tests are underway. Backup plan would be to use Teflon shims.	CLOSED

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200908-19	August 2009 Peer Review	Peer-19	Cutting vessel Ribs - need to perform reanalysis of vessel stress if modifications are being made. New design should try to avoid existing structure.	Mangra		Closed- Latest design does not require cutting of ribs	CLOSED
200908-20	August 2009 Peer Review	Peer-20	Consider additional increase in TF ground wall insulation for Mechanical purposes	Chrzanowski	Manufacturing study to determine feasibility of additional ground wall	Ground wall was increased from the original design.	CLOSED
200908-21	August 2009 Peer Review	Peer-21	TF turn -to-turn transitions should be balanced between top and bottom of machine in terms of toroidal progression. Error field (e.g. at plasma boundary) after best possible nullification by PF coils to be assessed.	Chrzanowski	The offset should be 5° on top and bottom.	Complete	CLOSED
200908-22	August 2009 Peer Review	Peer-22	Depth of threaded inserts in bolted TF joint should be increase to reduce “mushrooming” effect. Peaking of pressure around both is undesirable.	Willard		This is in the baseline design.	CLOSED
200908-23	August 2009 Peer Review	Peer-23	I'm not quite sure the cooling flow analysis took into account that the new OH coils may have for example up to eight 90° bends. Note: The model I gave Ali did not have the most current connections (it was still a work in progress)	Zolfaghari		This was considered in the design.	CLOSED
200908-24	August 2009 Peer Review	Peer-24	Evaluate eliminating CICADA with state of the art equipment	Sichta	Should perform cost analysis	Eliminating all CAMAC is out of scope for the NSTXU work-scope describe in the GRD. Some CAMAC systems will be converted to modern technology in order to maintain present data acquisition performance.	CLOSED
200908-25	August 2009 Peer Review	Peer-25	Build a simple mockup of the PF coil support structure to evaluate the design concept during the 2009 outage.	Viola		Closed The PF Cage was greatly simplified and a mockup is not required.	CLOSED
200908-26	August 2009 Peer Review	Peer-26	PF support system require to be insulated. Shall be then grounded by a single point ground	Mangra		Closed - This will be incorporated and detailed as part of the final design.	CLOSED
200908-27	August 2009 Peer Review	Peer-27	Is it not desirable to design the TF coil insulation system assuming 2k applied voltage?	Chrzanowski	TF insulation will have capability to be tested to 3 kv		CLOSED
200908-28	August 2009 Peer Review	Peer-28	Need to ensure that proposed PF coil support cage will define and maintain concentricity of outer PFs with TF bundle and OH solenoid. Concerned that whole cage could wander out of alignment.	Mangra	Can add support to the vessel if needed.	Closed- PF Cage has been eliminated.	CLOSED
200908-29	August 2009 Peer Review	Peer-29	TF joint should go through full scale testing (mechanical only) prior to design approval	Chrzanowski	Effectiveness of the testing needs to be evaluated. Previous tests didn’t reveal some of the issues seen on the final joints. Mechanical testing isn’t adequate the issues are electrical/mechanical/thermal in nature.	The joint is 5 times more robust than the current design so testing of the actual joint is not required. Testing of the flex connector to determine in service inspection intervals is being performed as part of the preliminary design.	CLOSED
200908-30	August 2009 Peer Review	Peer-30	VV Plates - 1. The 5% “Theta”~10 is too high a damping factor for SST. SST<0.1% ~ 0.05% (.0005), 2. Stability criteria (buckling) due to sum of all stress vacuum + support (TF) + dynamic is buckling of vessel	Titus	Will look at load damping and numerical damping.	(10/5/10) This should be closed. Unless we can document a larger damping, we plan to continue using the .5% damping. At some time in the future, we may make a stab at quantifying the magnetic damping, but until we do that calculation we will continue to use the low value.	CLOSED
200908-31	August 2009 Peer Review	Peer-31	1. Experimental data of pullout strength of insert is not conservative enough in this situation, 2. Actual situation is differential heating copper is heated by current. Stainless steel insert is room temperature (hot gets larger)	Titus	Perform axisymetric analysis of the insert in copper to determine the difference in strength. This could also be mitigated by overdesigning the joint.	The thermal gradient at the insert is insignificant and does not weaken the joint.	CLOSED

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200908-32	August 2009 Peer Review	Peer-32	Requirement to be given in a coordinate / plane independent value rather than shear, tension, etc. when possible	Dudek	Will use what is in the criteria document	Closed-Criteria document has been issued	CLOSED
200908-33	August 2009 Peer Review	Peer-33	For TF flex laminate joint consider polishing thread and using dry lubricant possible silver plate (.0005") to ensure clamping load is achieved without creating a torsional spring from the 3/8 x 6" bolt.	Willard		Closed - New design uses Superbolts which are lubricated and use jack bolts	CLOSED
200908-34	August 2009 Peer Review	Peer-34	Need to have appropriate physics validation for choice of aspect ratio. Less than 5% of NSTX shots have been run with A>1.5	Strykowsky	Out of Scope	Closed	CLOSED
200908-35	August 2009 Peer Review	Peer-35	Raising TF feed current to 130Ka raises concerns about inductive energy stored in buss work, switchgear etc. and consequences of failures. Need thorough FMEA including power supplies.	Ramakrishnan		(9/21/10) Will be presented during the FDR. (9/14/11) TFTR was designed and operated at much higher stored inductive energies so the busswork and switchgear to be used will be acceptable.	CLOSED
200908-36	August 2009 Peer Review	Peer-36	Need to consider effect of possible lithium coating on center stack on expected temperatures under radiative thermal equilibrium model	Brooks		This is planned as part of A. Brooks analysis.	CLOSED
200908-37	August 2009 Peer Review	Peer-37	Determine availability and cost of C1500 copper being suggested for TF flex (normally only rod, bar and wire)	Willard		Copper has been procured as part of the test samples.	CLOSED
200908-38	August 2009 Peer Review	Peer-38	1. When we go to the second stage of the upgrade to pulse every 1200 seconds, it will be necessary for the TF leads to be brought down to the MER providing a water cooled copper bus to the place where the power cables land in the MER. This requirement has to be kept in view while assigning real estate. 2. Even though it may entail additional cost, a 4kV OH may be desirable.	Smith	Performance / design requirements have changed from a period of 1200 seconds to 2400 seconds. Therefore this CHIT is no longer valid.	Closed	CLOSED
200908-39	August 2009 Peer Review	Peer-39	Need a "space czar" and a drawing to reserve critical real estate around the machine to coordinate the space needs of CSU and NBIU.	Perry		Perry is coordinating the real estate in an around the machine through the use of Lew Morris and a 3D model.	CLOSED
200908-40	August 2009 Peer Review	Peer-40	Verify test cell floor structure can handle NB loads, VV & PF cage loads, launching loads, etc.	Perry		This has been verified.	CLOSED
200911-01	October 2009 CDR	Chit-01	Castellated ends of center rod may generate stress concentrations due to transient loads, which causes cracks to propagate especially between two adjacent conductors. Consider alternate designs.	Chrzanowski		Will examine present design and consider changing ends of TF bundle to accommodate transient loads. This is being incorporated into the Preliminary Design	CLOSED
200911-02	October 2009 CDR	Chit-02	Consider using "CONFORM" extrusion process to make long conductors to avoid in-line braze joints. Luvata (Finland) have developed conform for copper conductors but may need to limit the silver content.	Chrzanowski	Investigate process, including the impact of reduced silver content.	Good suggestion- This process will be investigated in regards to the OH conductor. This will be done once the conductor design is far enough along to contact vendors for procurement information.	CLOSED

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200911-03	October 2009 CDR	Chit-03	Allowable shear stress of ~ 22MPa seems too high for epoxy resin at 100C under stress and fatigue loading. Check if a lower value is more appropriate. Is DZ80 primer used?	Chrzanowski	Verify vendor test data on this application, and to further document design details for the preliminary design.	Contacted CTD for available data at 100C. Have considered using DZ80 or alternative primer to enhance bond strength with conductor Vendor Supplied Data: CTD-101K SBS at 77K ~ 100 MPa SBS at 295 K ~ 65 MPa SBS at 373 K ~ 40 MPa	CLOSED
200911-04	October 2009 CDR	Chit-04	Determine shear strength of CTD101 epoxy resin at 100C by direct measurement. Explore making winding stack impregnated sample of conductor/insulation and test for fatigue at 100C. Also, consider shear and creep at 100C.	Chrzanowski	Concur. See chit #3	See Chit #3	CLOSED
200911-05	October 2009 CDR	Chit-05	TF Outer legs should be characterized for present mechanical strength since they will be subject to higher point loads at support points. Consider using the TF leg removed because of the water leak to get samples for static and fatigue testing.	Dudek	Consider tests on the unused outer TF leg to evaluate delamination, coil movement, etc.	This will be evaluated as part of the preliminary design. The plan was to repair this leg once off and keep as a spare. It that plan is not implemented we can perform the test. (Action: Mangra and Chrzanowski). 5/3/11 - The Outer TF leg being removed will be reworked and restored as a spare. Therefore no material is available for test.	CLOSED
200911-06	October 2009 CDR	Chit-06	Better determine the strength of the CD107 copper alloy at 100C by either direct measurement or published data specific for this alloy,	Chrzanowski		Will contact Copper Dev Assoc for additional data on 107 at 100C. 8/24/11 - Larry Dudek has the data.	CLOSED
200911-07	October 2009 CDR	Chit-07	Interface between TF and OH, if TF is run and OH is not, what happens? Is this a bad condition?	Neumeyer	Analysis indicates that this is a problem for full power TF only operation. Investigate design options that decouple the TF & OH. Action: C. Neumeyer/P. Titus/ J. Menard	A gap is being provided Avapour during winding. The material can be washed out after winding and curing. Tests are underway. Backup plan would be to use Teflon shims.	CLOSED
200911-08	October 2009 CDR	Chit-08	The machine Protection System is discussed but the philosophy is unclear. Is the design requirement based on this protection? Clarification is needed.	Neumeyer	Specify System	The Machine Protection System, a.k.a. Digital Coil Protection System (DCPS) has been budgeted and R. Woolley has been assigned the task of writing a requirements document. Design philosophy has been incorporated in the GRD.	CLOSED
200911-09	October 2009 CDR	Chit-09	Loads on TF – PF bracket unclear if degree of freedoms are satisfied. This is probably reasonable for the CDR level.	Titus	The appropriate number of degrees of freedom are restrained. The mechanics of the tangential radius rods is the same for both the TF to vessel connection and the PF cage to TF ring connection. A similar mechanical connection could be achieved with a sliding capture of the vessel gussets as suggested by Phil at the peer review. Vertical mismatch is accommodated with the spherical ball ends on the radius rods. If the cage is omitted, then the extra mechanism to maintain coincentricity is not needed.	Analysis to be completed as design matures towards a PDR.	CLOSED
200911-10	October 2009 CDR	Chit-10	Make sure that long lead time items are accounted for (for example; CFC tiles for armor)	Strykowsky		Lead times for procurements in the project schedule are based on experience with similar procurements or vendor quotes.	CLOSED
200911-11	October 2009 CDR	Chit-11	Vertical support for PF's need added supports. Stated design/analysis is in the works but not shown at this review.	Dudek	Investigate need for additional supports	The preliminary design has been updated for the operation limits. The PF3 coils only require an increase in weld size which will be performed in the field. The PF 2 coil bolts are adequate and the welds are currently being analyzed.	CLOSED
200911-12	October 2009 CDR	Chit-12	On friction stir welding: does the vendor who is supplying the Cu inner TF conductor know that they have to provide a tab (of sorts) to provide a cutoff portion for the welding.	Chrzanowski		Yes, this has been discussed with vendor during initial trials.	CLOSED

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200911-13	October 2009 CDR	Chit-13	Impact of as-built on analysis. Buckling failure mode sensitive to geometry. Fatigue failure mode sensitive to current cyclic life.	Titus		Analysis to be completed as design matures towards a PDR. This is being addressed as out-of round/or other imperfections are found in, primarily, the vessel. So far these are not an issue. One point raised in this discussion at the CDR was the shift in current centers and the magnetic stability of neighboring coils that are not perfectly concentric. This is being addressed analytically to assess resulting loads on the coils and the ability of the supports to take the lateral loads. (10/5/10 Closed - See 201006-12)	CLOSED
200911-14	October 2009 CDR	Chit-14	Concern about the differential thermal expansion at the interface between Cu and CuCrZr due to different electrical resistivity and other properties. Will there be high local stress on the friction stir welded joint?	Dudek	Consider/analyze/test as we approach a preliminary design.	The thermal gradient at the joint is negligible so the thermal stresses are also negligible. TF Flex Joint and TF Bundle Stub NSTX-CALC-132-06-00	CLOSED
200911-15	October 2009 CDR	Chit-15	In Tom Willard's presentation on slide "Current Joint Design vs. Upgrade Comparison", there's an error in Table 1. The current design flattop is ~.5 seconds, not 5 seconds as shown. This may propagate to table 3.	Dudek	Typo. correct and evaluate impact on table 3	This was just a typo in the table and has been corrected.	CLOSED
200911-21	October 2009 CDR	Chit-21	Consider including an interlock on plasma density as well as current, since new beams will be injecting through edge of plasma and overlapping strike point areas will increase power on armor tiles. (A redundant interlock to a pyrometer)	Stevenson	An interlock and operational strategy will be evaluated and delineated for PDR but the strategy still remains that the NBI armor is a sacrificial backstop to avoid heating the vessel in the event of a full power shot in the absence of plasma and with the failure of any and all interlocks. In this very unlikely event, the carbon tiles may need to be inspected and replaced. Pyrometers will be evaluated if a line of sight and range can be found but will be added for operations if needed.	A plasma current and fully redundant plasma current interlock will be provided. A Thermocouple scanner system of the armor will be provided. Closed.	CLOSED
200911-22	October 2009 CDR	Chit-22	Consider employing pyrometer(s) to monitor the surface of the neutral beam armor tile hot spots for a real-time interlock to terminate the beam pulse.	Stevenson	An interlock and operational strategy will be evaluated and delineated for PDR but the strategy still remains that the NBI armor is a sacrificial backstop to avoid heating the vessel in the event of a full power shot in the absence of plasma and with the failure of any and all interlocks. In this very unlikely event, the carbon tiles may need to be inspected and replaced. Pyrometers will be evaluated if a line of sight and range can be found but will be added for operations if needed.	A plasma current and fully redundant plasma current interlock will be provided. A Thermocouple scanner system for the armor will be provided. Closed.	CLOSED
200911-23	October 2009 CDR	Chit-23	The OH cooling system is designed for 600PSI water. This upgrade from 400PSI will increase flow about 20%. 600PSI is a high pressure. Suggest considering resizing holes to operate at 400PSI with back pressure to prevent any boiling.	Neumeyer	Menard/C. Neumeyer to evaluate design points and consider trade-offs.	A trade-study was performed to quantify the relationship between pressure, hole size, cool down time, and magnetic flux for the design with 24kA per turn and an alternate at ~ twice the current, ~ ½ the turns, which would have ~ ½ the winding length. A conductor design was found that can provide the required cooling rate at 400 psig.	CLOSED
200911-24	October 2009 CDR	Chit-24	Consider alternate solutions to the I&C system other than CAMAC. It is old and fraught with problems and difficult to debug failures. Now may be the time to replace	Sichta	evaluate.	The GRD has been revised to specify that the post-shot data acquisition and analysis time should be the same as before the upgrade. The design presented at the PDR will consider this.	CLOSED
200911-25	October 2009 CDR	Chit-25	Presentation of Design before analysis in reviews would be an improvement.	Strykowsky	Out of Scope for this review. PPPL to consider for future reviews.	Closed	CLOSED
200911-26	October 2009 CDR	Rec CS-01	Develop criteria for allowable load conditions that require protection by the MPS as soon as possible to be used for preliminary design.	Neumeyer	See 200911-08	See 200911-08	CLOSED

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200911-27	October 2009 CDR	Rec CS-02	Write a design specification to collect and identify all design critical components which exceeded allowables that would guide MPS design.	Titus		Detailed stress analysis of all the components that might have to be incorporated into the DCPS will occur during the Final Design. The intention is to require a section in each calculation that we file, that will outline the algorithm that will be incorporated into the DCPS. These will be listed by reference to the calculation in a design load specification which simply will be a list of algorithms and their calculation number sources. The calculations will be "living documents". It is likely the algorithms will have to be adjusted as needed as they cause un-necessary trips or the calculations need updating. The scope of the input to the DCPS can be inferred from the number of calculations being filed. Plan to have some of these calculation algorithm descriptions in calculations that we file before the Lehman PDR review.	CLOSED
200911-28	October 2009 CDR	Rec CS-03	Reconsider radial build of the centerstack to allow a more effective slip plane between the components even if there is some loss of i^2*t capability on the solenoid.	Neumeyer	See 200911-07	See 200911-07	CLOSED
200911-29	October 2009 CDR	Rec CS-04	Develop a supporting R&D program	Chrzanowski		Developed document outlining R&D requirements for Upgraded Centerstack. Also developed an R&D Plan.	CLOSED
200911-30	October 2009 CDR	Rec NB-01	Consider a more modest modification of the proposed large cutout of the vacuum vessel for the new beamline.	Stevenson	Smaller cuts in the vessel were evaluated prior to arriving at the present design solution. The increased tangency radii are necessary for current drive and higher performance which are key goals of the upgrade. The increased tangency radii, the NBI fan array, and the TF outer leg at Bay K require a change to the Bay K opening because the beam trajectory cuts across the interstitial wall of the vacuum vessel between Bay K and Bay J. Because of the removal of the metal in the area to allow beam passage a cap was added to move the vacuum boundary out and to carry the stresses in this region. Rather than lose Bay J for diagnostics, the port was added to the cap also. These issues drove the size of the cap and the size of the VV hole.	Closed.	CLOSED
200911-32	October 2009 CDR	Rec NB-03	Consider replacing data acquisition and I&C CAMAC systems with something more modern and reliable.	Sichta	See 200911-24	See 200911-24	CLOSED
200911-33	October 2009 CDR	Rec NB-04	Incorporate better interlocks (Ip and density) and monitoring (real-time pyrometers) of the beam armor tiles.	Stevenson	See 200911-22	See 200911-22	CLOSED
200911-34	October 2009 CDR	Rec NB-05	Install and maintain strict procedures for radiological control for contaminated beamline maintenance.	Stevenson	The existing beamline is assumed to be contaminated and is already treated as a radiologically contaminated beamline with full ES&H radiological procedure adherence now due to the presence of contaminated ion sources. Strict procedures exist and are employed on the existing beamline until it is show by surveys and samples to be not contaminated. This procedural approach will continue on with the new beamline also where the full regimen of HP RWP postings and support will be required for maintenance. So, due to the aforementioned sources, the very necessary procedures advocated by this chit have been in use for some time and fully meet the recommendations of the chit.	Closed	CLOSED
200911-35	October 2009 CDR	Rec C&S-01	Complete all elements of all WAFs, maintaining a common, crisp format.	Strykowsky		In process. Will be completed for the CDR in December	CLOSED
200911-36	October 2009 CDR	Rec C&S-02	Complete all fields in the risk registry.	Perry		Updated and included in the CD-1 package	CLOSED

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200911-37	October 2009 CDR	Rec C&S-03	Document the risk management plan (a CD-1 requirement) in the PPEP	Perry		Updated and included in the CD-1 package	CLOSED
200911-38	October 2009 CDR	Rec C&S-04	Establish and implement a staffing plan to CD-2 that accounts for monthly assignments of specific tasks, self-consistent with the resource-loaded schedule.	Strykowsky	Staffing plans will be prepared that show individuals by name and their loadings by month. These will be prepared on a 6-12 month rolling wave to better ensure the achievability of the schedule.	4/29/11 - Complete with the successful approval of CD2	CLOSED
200911-39	October 2009 CDR	Rec C&S-05	Continue to implement PU Advisory Board recommendations to refine and improve the rigor of the risk/contingency development in advance of CD-2.	Strykowsky		Supplemental contingency methodologies will be explored and utilized prior to CD-2. Closed by R Strykowsky on 3/1/11.	CLOSED
200911-40	October 2009 CDR	Rec C&S-06	Also, consider using risk matrix deadline dates to inform contingency distribution plan before Lehman CD-1 review	Strykowsky	Distribution of contingency as a function of time will be tempered by when risk are likely to occur.	Will be incorporated into future analyses.	CLOSED
200912-01	December 2009 Lehman CD-1	2.1-01	Magnets and Core - 1. Update FMEA to ensure any new failure modes/loading conditions associated with the upgrade are mitigated.	Dudek	FMEA to be updated for PDR	FMEA has been updated and is in the process of being signed off	CLOSED
200912-02	December 2009 Lehman CD-1	2.1-02	Magnets and Core - 2. Consider the 40 kA design for the solenoid to reduce coolant pressure and voltage. The additional cabling from the power supplies to reach the higher current can be added later.	Dudek	This was considered and was found to be unacceptable since the coils would not perform well enough at 24kA, however an optimized solution using a slightly larger coolant passage was developed to work at 24kA and the existing coolant pressure.	Closed	CLOSED
200912-03	December 2009 Lehman CD-1	2.1-03	Magnets and Core - 3. Add the availability of additional key personnel to risk registry.	Dudek	This will be added to the risk registry.	Key personnel have been added to the Risk Register	CLOSED
200912-04	December 2009 Lehman CD-1	2.2-04	Neutral Beams - 4. Perform tests of a heated decontaminated copper part to confirm that tritium levels remain low.	Stevenson	Concur. Ion dump samples will be taken and heated in the source shop oven to evaluate.	Core will be removed when dump disassembled. Closed.	CLOSED
200912-05	December 2009 Lehman CD-1	2.2-05	Neutral Beams - 5. Consider methods to improve estimates of contamination levels in NSTX due to residual NBI source and beamline contamination and evaluate the impact on the future operation and maintenance of NSTX.	Stevenson	Concur. Surveys and trends will provide data for a peer review in April 2010 to address this subject.	Decon Peer Review successful. Closed.	CLOSED
200912-06	December 2009 Lehman CD-1	2.2-06	Neutral Beams - 6. Estimate the increased activation level of the vessel due to the longer pulse and higher power operation and the resulting increased dose to workers.	Stevenson	Concur. Activation levels will require posting machine areas per normal HP procedures. However, doses will still be very low and will not preclude doing normal work. Calculations and estimates in progress. Extrapolations from existing levels after longer pulses but with higher neutron production will still be very low (<1 mR/hr) but areas will need to be posted. The actual activation will be determined by experimental operations and will be monitored and posted per normal procedures.	NTC Areas will be posted. Closed.	CLOSED
200912-07	December 2009 Lehman CD-1	2.2-07	Neutral Beams - 7. Consider alternative methods of protecting the NB armor tiles from excessive heating using real-time monitoring of the surface temperature.	Stevenson	See 200911-22	See 200911-22	CLOSED
200912-08	December 2009 Lehman CD-1	2.2-08	Neutral Beams - 8. Consider replacing old Computer Automated measurement and Control (CAMAC) hardware with modern technology.	Stevenson	Will consider but not required for initial operations. Existing channels and spares are adequate.	NSTX Ops may reconsider at a later date.	CLOSED

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200912-09	December 2009 Lehman CD-1	2.2-09	Neutral Beams - 9. Additional effort should be directed at evaluating the process of machining and installation of the large midplane port to reduce schedule and cost risk.	Stevenson	Concur. Cutting tests on SS have been performed prior to PDR.	Tests of gas shield plasma cutter on half inch SS have been completed and proven to produce excellent results.	CLOSED
200912-10	December 2009 Lehman CD-1	2.2-10	Neutral Beams - 10. Perform early vendor search (both domestic and foreign) for the large bellows.	Stevenson	Concur.	Vendor found and prelim quote provided (included in estimate).	CLOSED
200912-11	December 2009 Lehman CD-1	2.2-11	Neutral Beams - 11. Re-examine the design to determine whether one of the large bellows can be eliminated.	Stevenson	Concur.	Two bellows evaluated and both are required. Rectangular bellows takes radial and vertical growth during bakeout. Circular bellows collapses for TIV removal and to provide clearance for assembly/disassembly of duct. Hard mounting of TVPS between dictates the use of both bellows. Costs for both are included in job.	CLOSED
200912-12	December 2009 Lehman CD-1	2.2-12	Neutral Beams - 12. The full cost of all diagnostic relocations should be included in the project costs.	Stevenson	Cost for removing and re-installation diagnostic hardware necessary to gain access to the machine and to facilitate installation of the CS and NBI are included in the project scope. Modifications to diagnostics necessitated by upgrade operational levels are not included in the project scope BUT will be covered by the NSTX Program operation activity. Accommodations for Diagnostics have been made on VV. MPTS job included for interface required to re-aim MPTS.	Appropriate scope included in Upgrade cost. Other Diagnostic scope included in NSTX Program Operations. Closed.	CLOSED
200912-13	December 2009 Lehman CD-1	2.3-13	Ancillary - 13. Evaluate including the additional TF cabling and bus leads to allow a 20-minute shot repetition rate.	Dudek	As specified by the GRD at the full rated pulse length, the repetition period shall be 2400 sec, but upgradeable to 1200 sec. Rough estimates for upgrading now to the 1200 sec duty rate would cost an additional $500-$600K.	The TF cabling will be sized to satisfy the current GRD requirement of 2400 sec BUT will allow for a future upgrade. However, should cost opportunities present themselves this upgrade will be considered as an inclusion to the TPC.	CLOSED
200912-14	December 2009 Lehman CD-1	2.3-14	Ancillary - 14. Obtain operational experience for control systems from other facilities in order to determine the expected reliability and the level of redundancy required to achieve a desired overall reliability.	Hatcher	This will be done as part of the preliminary design once the requirements for the DCPS are developed.	The DCPS requirements are currently being written, the first draft has been submitted for review. This was reassigned to Ron Hatcher. Outside organizations were contacted, however no one had developed a similar system that could be used as a model.	CLOSED
200912-15	December 2009 Lehman CD-1	2.3-15	Ancillary - 15. Complete a Failure Modes and Effects evaluation.	Dudek	See Item 200912-01	See Item 200912-01	CLOSED
200912-16	December 2009 Lehman CD-1	3-16	Cost Estimate - 16. Develop a mutually agreed funding profile between DOE/FES and the project by January 2, 2010.	Strykowsky	Funding profile established. CD-1 documents updated and submitted to DOE-PSO	OFES evaluating alternate scenarios provided. This item is closed.	CLOSED
200912-17	December 2009 Lehman CD-1	3-17	Cost Estimate - 17. Update all project documents and submit for CD-1 approval.	Strykowsky	Funding profile established. CD-1 documents updated and submitted to DOE-PSO	OFES evaluating alternate scenarios provided. This item is closed.	CLOSED
200912-18	December 2009 Lehman CD-1	4-18	Schedule and Funding - 18. Develop a mutually agreed upon funding profile between DOE/FES and the project by January 2, 2010.	Strykowsky	Funding profile established. CD-1 documents updated and submitted to DOE-PSO	OFES evaluating alternate scenarios provided. This item is closed.	CLOSED

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200912-19	December 2009 Lehman CD-1	4-19	Schedule and Funding - 19. Update all project documents and submit for CD-1 approval.	Strykowsky	Funding profile established. CD-1 documents updated and submitted to DOE-PSO	OFES evaluating alternate scenarios provided. This item is closed.	CLOSED
200912-20	December 2009 Lehman CD-1	5-20	Management and ES&H - 20. Work with DOE/FES to develop a plan that is consistent with a mutually agreed upon funding profile and meets technical scope, cost, and schedule requirements with adequate contingency. Include agreement on CD-4 completion requirements. Update all documents based on this realistic project funding profile and submit for CD-1 approval (Prior to CD-1).	Strykowsky	Funding profile established. CD-1 documents updated and submitted to DOE-PSO	OFES evaluating alternate scenarios provided. This item is closed.	CLOSED
200912-21	December 2009 Lehman CD-1	5-21	Management and ES&H - 21. Establish project management and technical advisory committees that meet regularly and report to the PPPL Director on NSTX Upgrade project status.	Prager	PPPL agrees with the intent of this recommendation and believes the NSTX Upgrade Project and the PPPL Director's Office currently benefits from several independent advisory groups. 1) The NSTX program has an established semiannual Program Advisory Committee which focus on the program physics and machine upgrades. 2) Princeton University has established a standing PPPL Advisory Committee that presently meets semi-annually where the agenda includes NSTX physics, engineering and management issues. 3) The NSTX Upgrade Project also benefits from independent/external technical design review committees which include assessments of project management. We feel additional reviews at this time will result in minimal incremental benefits while costing additional resources. However, once the project is beyond CD-3 and into construction we will convene periodic advisory committee reviews of the project's technical and management progress.	Closed.	CLOSED
201003-01	March 2010 NBIU Peer Review	Peer-01	Locations of Test cell Stairs and Platforms: (a) Must be approved in writing by the construction manager and placed on the official NSTX General Arrangement Drawings, (b) Must be in compliance with the international building code, and (c) Must have lighting, sprinkler, and fire protection under them.	Denault	Concur.		CLOSED
201003-02	March 2010 NBIU Peer Review	Peer-02	Shielding block design for HVE access needs to be looked at.	Denault	Concur. Action: Martin Denault to review.		CLOSED
201003-03	March 2010 NBIU Peer Review	Peer-03	Address each prior open chit and open risk at the PDR	Stevenson	Concur. Action Tim Stevenson.		CLOSED
201003-04	March 2010 NBIU Peer Review	Peer-04	Consider extending the 2nd level platform for better access to the North and East side of the vacuum vessel	Denault	Concur. Action: Martin Denault to investigate. Access will be optimized, but options in these areas are greatly limited.		CLOSED
201003-05	March 2010 NBIU Peer Review	Peer-05	Get Vendor quote(s) on fabricating rectangular bellows	Stevenson	Concur. Action Tim Stevenson.		CLOSED
201003-06	March 2010 NBIU Peer Review	Peer-06	Consider removing horizontal NB armor support bars in front of Bay I. Removing them would make the Bay I port more flexible for diagnostic use.	Priniski	Concur: Craig Priniski to investigate.	Kelsey Tresemer took over action when Priniski left PPPL.	CLOSED

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201004-01	April 2010 CSU Peer Review	Peer-01	Latest OH currents are -24, 0, +24 kA. The design so far is based on OH current of -24, 0, 13 kA. Need to determine if forces envelope has expanded and what consequence is to design (Mangra)	Titus		(10/5/10) +/- 24 kA is used throughout the analysis'	CLOSED
201004-01	April 2010 NBIU Decon Peer Review	Peer-01	Evaluate the need for HVAC modifications in the NSTX Test Cell to accommodate the 2nd NBI to ensure control of potential tritium contamination and ensure that tritium released to the environment is monitored.	Stevenson	a) Regens will be to Stack b) Elephant trunk stations will be reactivated and also connected to the stack c) HVAC goes to stack. Negative pressure not required but advisable. Approx. 10k job.		CLOSED
201004-02	April 2010 CSU Peer Review	Peer-02	Jim C - Use correct no. of turns and current on PF coils in presentation.	Chrzanowski		VG Corrected	CLOSED
201004-02	April 2010 NBIU Decon Peer Review	Peer-02	Document and review the analysis that there is no mode of force that would move remaining tritium contamination from the NBI into the NSTX vacuum vessel.	Stevenson	a) NBI will not inject trace tritium per TFTR DT operating experience b) NBI regens will have TIV closed and evacuate to the stack c) NBI acts as a large vacuum pump on VV when TIV is opened (> 10,000 Tl/s) d) X2 e) Operations pumps and purges D2 every shot which is pumped by the BLs f) Water vapor pumped by LN panels and regened to stack at the end of the run		CLOSED
201004-03	April 2010 CSU Peer Review	Peer-03	Make sure surface area of contact between tiles and backing surface is sufficient for disruption current and heat loads	Tresemer	Disruption current analyses are under consideration and in process. Considering re-introduction of Grafoil.	(9/14/10) Open, but will be addressed and resolved during the final design period, with results presented at the FDR. (6/6/11) As per analysis findings that Grafoil was needed, it was re-introduced into the design. Tiles now have adequate thermal and structural contact with centerstack.	CLOSED
201004-03	April 2010 NBIU Decon Peer Review	Peer-03	Document the expected difference between current and post-upgrade routine NSTX operations and maintenance protocols.	Stevenson	a) VV purged and surveyed after every run - no change b) BL purged after a run before line breaks - no change c) All equipment from VV vacuum smeared before removal from NTC - no change d) All NTC equipment surveyed before removal from NTC - no change e) All RWP areas and radioactive materials posted and monitored by HP - no change f) BL maintenance will continue to need RWP posted and PCs similar to Decon - no change		CLOSED
201004-04	April 2010 CSU Peer Review	Peer-04	TF coil alignment, what is the requirement can the spring supports be pushed / held in place for installation (note there is no metrology data on OTF leg locations)	Smith	Alignment criteria has been provided. TF outer leg alignment considerations are being worked out with the installation team.	In progress / closed.	CLOSED
201004-05	April 2010 CSU Peer Review	Peer-05	“Organ pipe” elbows sealing gasket is trapped or unreplaceable	Chrzanowski	Will use "Viton" O-rings instead of hard seals so that seals can be reused instead of replacement.		CLOSED
201004-06	April 2010 CSU Peer Review	Peer-06	Provide substantial clearance between TF coil brace and Thomson scattering support structure. Clearance should at least be 1 inch	Mangra		OTF Supports have been remodeled and are now compatible with the MPTS Stand	CLOSED

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201004-07	April 2010 CSU Peer Review	Peer-07	Labik needs to get a model of the 30" flange modification to Danny Mangra to verify compatibility with external upgrade hardware	Labik		OTF Supports have been remodeled and are now compatible with the MPTS Stand	CLOSED
201004-08	April 2010 CSU Peer Review	Peer- 08	Can the Bay K cap for NB be modified to accommodate the MPTS Laser Dump.	Labik	No A separate new port will be designed	No A separate new port will be designed	CLOSED
201004-09	April 2010 CSU Peer Review	Peer-09	Raki - Check parameters on Inner PF coils on VG for correctness? (Typo)	Ramakrishnan		VG's corrected	CLOSED
201004-10	April 2010 CSU Peer Review	Peer-10	Is the 10Gbit/sec network required as part of the GRD?	Sichta	Yes. The 10 Gbit is an implementation to satisfy the requirement that data acquisition, analysis, and visualization should not be degraded (in light of 4x data load).		CLOSED
201004-11	April 2010 CSU Peer Review	Peer-11	Consider allowing slight adjustment capability (+- 1/16") for vertical tiles along center stack. Allows "flats" machine on tile surfaces as microwave reflectors to be moved to compensate for clocking difference between CS and outer vacuum vessel.	Tresemer	Dismissed. Design changes do not affect this adjustability aspect.	Open, but will be addressed and resolved during the final design period, with results presented at the FDR.	CLOSED
201004-12	April 2010 CSU Peer Review	Peer-12	Produce a TF/OH manufacturing plan, including a fabrication facility design, for the PDR. Identify hardware that needs to be purchased "a schedule" This is a task we want to get started on before the FR/CD3 thus we need to ask for DOE permission.	Chrzanowski	Concur - will provide detail manufacturing and procurement plan	This will be completed prior to FDR. Has not been started.	CLOSED
201004-13	April 2010 CSU Peer Review	Peer-13	Develop design for MPTS VV interface and incorporate into the project scope. Generate WAF for the entire MPTS relocation but only include the VV interface into the project Scope.	Labik	WAF Developed and included in base estimate	WAF Developed and included in base estimate	CLOSED
201004-14	April 2010 CSU Peer Review	Peer-14	What R&D wont be complete by the PDR and clearly show what assumptions are being made for estimating purposed. What impacts if R&R is not successful (show in risk registry)	Chrzanowski	Testing of new primer will need to be completed to determine max shear bond strength/ additional testing of Aquapour for winding OH coil will also be completed. Note: Date Ref #'s 201004-14, 201006-13, and 201006-24 are all related. See 201006-13 for details.	Have submitted requisition (409966) for CTD to perform shear bond tests. PO has not been placed as of 11/17/10. Aquapour tests is still awaiting mold to be completed by tech shop, so that tests can proceed.	CLOSED
201004-15	April 2010 CSU Peer Review	Peer-15	Resolve I&C requirements. Paul should estimate scope as presented and resolve during a WAF review meeting.	Sichta	WAF updated and reviewed prior to PDR.		CLOSED
201004-16	April 2010 CSU Peer Review	Peer-16	Tresemer's bolt connection (Dzus fastening tech) looks like the profile will produce large stresses in the tile. Tailor the countersink appropriately. Interesting concept though.	Tresemer	Dismissed. Not following this design line.	Open, but will be addressed and resolved during the final design period, with results presented at the FDR.	CLOSED

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201004-17	April 2010 CSU Peer Review	Peer-17	Corner stress on the TF leg shown by Willard looks like stress discontinuity, would tweak geometry, move hole and add more material before mesh refinement to see if it can be eliminated. Also, look at stress linearization and apply NSTX criteria for evaluation.	Willard	Response : The hole spacing was established by the minimum edge distance required by the Tap-lok inserts, and the minimum clearance required between the Supernut hardened washers. Peak stresses occurred at the same location determined by a separate MathCAD hand analysis, where all the stresses superimpose: OOP bending stress; hoop stress; thermal stress; and in-plane bending stress. Quadrupling the mesh on the worst-case lamination resulted in an increase in the peak stress, a shifting of the peak stress location to coincide with stiffness/ geometry discontinuities, and a reduction in the size of the peak stress area, all confirming a singularity. A stress linearization test was performed using the WB feature to determine the maximum combined primary membrane and bending stress, which was compared to the allowable stress from the design S-N fatigue curve.		CLOSED
201004-18	April 2010 CSU Peer Review	Peer-18	I see both Von Mises and Tresca stress results shown, Typically Tresca is what is requested in codes, not sure what NSTX design criteria states.	Titus		(10/5/10) We are trying to consistently use Tresca as is required by the NSTX criteria document. The difference between Tresca and VonMises is less than 15%.	CLOSED
201004-19	April 2010 CSU Peer Review	Peer-19	For Superbolts - torque-load curve may not match manufacturer. No Belleville with Supers. Presentation showed bolts designed typical sm value (2/3SY). Typically, bolts can do to at least 80% proof.	Willard	Response from Superbolt: “Superbolts have been installed in thousands of applications over the years with no reported problems with loosening. They are covered in the following Navy documents: NSTM-075-Basic Navy Fastener manual; GYD010-Submarine Fastener manual; and NSTM-233-Steam Turbine manual.” The Superbolt brochure shows many high cyclic load applications, all without Belleville washers: the design relies on the compliance of the nut body to maintain stud pretension. No Belleville washers or locking features will be used in the flex strap bolted joint design. A clarification to the NSTX Design Requirements document now allows a maximum bolt preload stress of .75 Sy, and a maximum operating direct tension plus preload stress of .9 Sy.		CLOSED
201004-20	April 2010 CSU Peer Review	Peer-20	CTD 101K - other large fusion projects use a variant of this which may offer a cost reduction (2X).	Chrzanowski	NSTX upgrades will use CTD101k since it is well documented and provides operating results as required		CLOSED
201006-01	June 2010 PDR	Chit-01	All NSTX components, including passive plates, etc. must be compatible with the design point. Any modifications which may be necessary must be included in the cost. See GRD 2.1.2.a	Dudek	All NSTX components required for upgraded operations, as described in GRD section 2.1.2, will be compatible with the design point. There are two risks being carried in the risk register to cover passive plate hardware and tiles in the event detailed analysis shows they need upgrade. The weighted cost included in the contingency is $762k.	The design is following the GRD including para 2.1.2. Passive plates do not require reinforcement per calc number NSTX-CALC-12-01-01. Update of Analysis of Vacuum Vessel and Passive Plates.	CLOSED
201006-02	June 2010 PDR	Chit-02	"Flash Shields" between terminals of TF bundle should extend at least over full length of terminals, if not beyond. Also, consider alternate terminology.	Chrzanowski	Concur. Will be incorporated in the final design	Final drawings being generated in Cad room. This detail will be included on those drawings.	CLOSED
201006-03	June 2010 PDR	Chit-03	Provide feature to maintain concentricity between OH and TF bundle, considering 0.1" gap after removal of Aquapour.	Chrzanowski	Concur. Will be incorporated in the final design. Note: Date Ref #'s 201006-03 and 201006-20 are all related.	The lower OH coil is secured to support structure. A urethane band will be installed at upper end to allow for thermal growth while maintaining concentricity. Will be included on final drawings.	CLOSED
201006-04	June 2010 PDR	Chit-04	Ask Kabelmetal Corp. in Osnabruck, Germany to manufacture copper wedges with cooling hole in it. (as done for MAST)	Chrzanowski	Concur. Will be incorporated in the final design	Have without success been able to contact Kabelmetal. Analysis is complete with side cooling groove, so extrusion will not have inner cooling hole. COMPLETE	CLOSED

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201006-05	June 2010 PDR	Chit-05	TF centre rod temperature close to flags is over 100C and may creep under stress. Consider shaping the wedge/flag area to reduce peak temperatures and stress.	Titus	We are increasing the corner radius and exploring other ways of increasing the cross in the corner to drop the temperature. Also Jim Chrzanowski and CTD are exploring primers that can survive the temperature.	(10/5/10) A Cyanate Ester primer was chosen for the epoxy system . This primer produces a VPI with CTD 101K with shear and tensile stress allowables high enough that local high spots in the TF corner are no longer a problem.	CLOSED
201006-06	June 2010 PDR	Chit-06	Consider using graphite tiles for centre tub even if it needs increasing the centre column radius by a few mm to save cost (and time)	Tresemer	Concur. Tile optimization is ongoing and graphite will be considered. CS Diameter is specified by this project's GRD and any changes will have to be reviewed by Project Management.	(9/14/10) 'Open, but will be addressed and resolved during the final design period, with results presented at the FDR. (6/6/11) Due to administrative ruling, all tiles shall be ATJ graphite. Chit can be closed.	CLOSED
201006-07	June 2010 PDR	Chit-07	The insulated joint in the outer TF support should be reconsidered if it is necessary and if necessary how is shear load carried.	Smith	Mark Smith to follow up with physicists regarding fields/eddy currents at the TF support locations. Are dielectric breaks required? If so, how many? Note if breaks are required, FEA reveals low joint stress. Therefore, several materials are available with appropriate strength and insulating properties. If high strength materials are required, ceramic flame sprayed SS hardware and components can be used.	FEA of the joint is ongoing. Results are being evaluated to determine course of action as discussed in previous block. (8/11/10) - Status unchanged, work still in progress. (4/27/11) – Closed: Dielectric breaks are not required per review with the physicist. The shear load has been accommodated with the new joint design.	CLOSED
201006-08	June 2010 PDR	Chit-08	Flaw size for CS conductor is less than .5 square mm. If joint is required, how is this measured? In no joint is necessary, how is conductor inspected?	Chrzanowski	Must investigate whether this requirement is needed.	This requirement has not been included will not be included in previous conductor procurements and is not being included manufacturing requirements. COMPLETE	CLOSED
201006-09	June 2010 PDR	Chit-09	Currently, the outer joint of the TF flex is torqued. Reconsider using tensioner.	Chrzanowski	Will consider	Both inner and outer flex joints use the super nuts and torquing requirements. COMPLETE	CLOSED
201006-10	June 2010 PDR	Chit-10	Check strength and modulus of room temperature stycast (epoxy)for use on the TF castle (teeth).	Chrzanowski	Concur. Will be incorporated in the final design	The TF teeth/crown structure will be fabricated in-house with a wet layup process with glass positioned circumferentially in structure to provide maximum strength. Stycast will not be used.	CLOSED
201006-11	June 2010 PDR	Chit-11	At each review, a new tile connection scheme is shown. This latest one has not been used in other fusion machines. May present some R&D. Perhaps going with another fusion experiment's method should be considered.	Tresemer	Concur. This recent connection scheme actually changed little from the current (in place) design. We've replaced the weld stud with an internally threaded tube. Just prior to PDR, recent consideration of the issues of bearing upon the material began, and special focus will be placed on the relationship between the forces applied and the surfaces accepting. Thermal and mechanical loads have been considered and preliminary analyses' results are within acceptable limits. R&D for this system is already planned and will be included for the FDR. Tolerances, loading, presence of Grafoil are being, and will continue to be reviewed. Directionality and density of the CFC fibers will be evaluated, pending approval of NDAs and the arrival of said information	(9/14/10) 'Open, but will be addressed and resolved during the final design period, with results presented at the FDR. (6/6/11) Fastening scheme, due to space constraints, has reverted to a design very similar to the present NSTX configuration. Spiralock threads are being used, but only on half of the tiles. Spiralock threads are not high tech changes, and should pose no threats or risks to the system.	CLOSED
201006-12	June 2010 PDR	Chit-12	Add tolerances to analysis models (radial, height, ovality, etc.). Check if these cause any forces on structure (any decentering?). In general, not much talk about tolerances throughout the day.	Titus	Magnetic stiffness / stability analysis have been performed for PF1a and OH. Other coil systems are better supported and can accept larger misalignments.	(10/5/10) This should be considered closed, PF1a/OH interaction was the most critical because the centerstack casing bellows was the only stiffness available to support the de-centering loads. These calculations may be picked up again for other PF coils but this is expected to be a "non-issue" .	CLOSED
201006-13	June 2010 PDR	Chit-13	Primer for copper: If CTD can develop a new high temperature primer it may need static and fatigue testing. If not then could use cyanate ester based primer but be aware of safety and handling issues.	Chrzanowski	CTD presently developing primer to meet our requirements. Note: Date Ref #'s 201004-14, 201006-13, and 201006-24 are all related.	Will use Cyanate ester CTD-450 primer that meets requirements at temperature. CTD tests will be performed to verify analysis assumptions. (see peer-14). 8/23/11 Final report is in progress. The results indicate that some modifications may need to be incorporated to the operational scenarios.	CLOSED
201006-14	June 2010 PDR	Chit-14	After "Aquapour" is removed from between OH and TF coil assemblies in CS, how will 0.1" gap be maintained/monitored, etc., to allow coils to remain concentric.	Chrzanowski	Concur. Will be incorporated in the final design	See Date Ref 201006-03. This chit is closed as it will be tracked via the answer to chit 3 from the June 2010 PDR.	CLOSED

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201006-15	June 2010 PDR	Chit-15	Use of superbolts on electrical connections is a new application. Concern is related to thermal cycling of joint and braze/solder creep under high load.	Chrzanowski	Response : The vendor strongly recommends against using Bellevilles with the SuperNuts, stating that they've never had a report of a nut loosening from thermal cycling when the pretention is over 40% of the proof load of the stud: the compliance of the SuperNut eliminates the need for a compliant washer. ACTION PLAN: test this by thermal cycling a simulated joint - made of C18150 copper, equipped with TapLok inserts and SuperNuts - and verifying that there is no loss in pretension, by monitoring the stud tension with the ultrasonic probe and a load cell washer. Lamination joint braze/ solder creep and fatigue strength will part of the tests performed on a prototype Flex Strap Assy.	11/5/10, In discussion with J. Chrzanowski, this was reopened and reassigned to him (previously T. Willard). The superbolts are to be tested to verify that they work as designed. Target for completion is end of November 2010. 8/23/11 Test ran by Tom Kozup and results are with Larry Dudek.	CLOSED
201006-16	June 2010 PDR	Chit-16	Consider using capacitive discharge testing on OH solenoid to test inter-turn and inter-layer insulation.	Chrzanowski	The use of capacitive discharge testing on OH solenoid to test inter-turn and inter-layer insulation is being considered. Exploring the lease/rental of testing equipment to perform test. To be completed by the FDR.	(11/29/12) A testing plan for the OH solenoid will be developed in manufacturing procedure D-NSTX-IP-3395. This procedure is not yet released. (11/12/13) A test plan for the OH solenoid has been written and is included in approved procedure D-NSTX-IP-3395 Rev.00. The procedure identifies the need for an impulse test, but details will need to be completed and added as revision to this procedure. Impulse procedure details to be completed by end of January 2014	CLOSED
201006-17	June 2010 PDR	Chit-17	The tile design requirements need to be clearly identified. (Heat load profile, peaking factors on edges, allowable temperatures, dimensional tolerances, halo currents - both local and global)	Titus	Identification of the tile design requirements are in progress.	(10/5/10) This should be dispositioned by Kelsey. Art Brooks will be working on the analysis after the ITER ELM PDR. (11-9-11) This is being addressed via CALC-11-03-00 titled "Final Tile Stress Analysis (ATJ Tiles)".	CLOSED
201006-18	June 2010 PDR	Chit-18	Consider past experiences from other fusion devices in the tile design. Tile design needs further development, particularly with attention to fastener concept evaluating hold down stresses.	Tresemer	(see PDR Chit-11)	(9/14/10) Open, but will be addressed and resolved during the final design period, with results presented at the FDR. (6/6/11) Hold down stresses have been evaluated in analysis and are within limits.	CLOSED
201006-19	June 2010 PDR	Chit-19	The definition of the CFC linked to requirements. Density, weave, graphitization temperature all need to be fed back to the design.	Tresemer	Concur. Information still pending thermal and mechanical requirements dictated by pending analyses.	(9/14/10) 'Open, but will be addressed and resolved during the final design period, with results presented at the FDR. (6/6/11) Resolved. No longer using CFC as a material.	CLOSED
201006-20	June 2010 PDR	Rec-01	Slip plane - Add a radial position restraint between the CS and TF to prevent excessive lateral motion during operation	Chrzanowski	Concur- Will investigate	See Date Ref 201006-03 for details. This chit will be closed and tracked via the referenced chit.	CLOSED
201006-21	June 2010 PDR	Rec-02	Solenoid conductor braze joints - Finalize the manufacturing process for the CS conductor.	Chrzanowski	Concur- once conductor length can be verified, braze joint process will be finalized	(11/29/12) A braze unit was purchased for this activity. The brazing is expected to be started December 2012. (12/2/13) 11/12/2013 The braze procedure has been finalized and is included in procedure D-NSTX-IP-3395. Qualification of individuals has been completed.	CLOSED
201006-22	June 2010 PDR	Rec-03	Manufacture of centre rod wedge conductors - Ask Kabelmetal at Osnabruck, Germany, to quote for the extrusion of the wedges. They have previously made the wedges for MAST centre rod, which included the cooling channel inside the wedge, which reduces machining and soldering.	Chrzanowski	Concur- will contact Kabelmetal to explore their capabilities	See chit 4 COMPLETE (201006-04)	CLOSED
201006-23	June 2010 PDR	Rec-04	•Manufacture of centre rod wedge conductors - Add additional material to the copper alloy flag to reduce maximum temperatures and stresses.	Chrzanowski	This will be investigated as a possible option for reducing temperatures and stresses	Additional lead material has been added to detail drawings. COMPLETE	CLOSED
201006-24	June 2010 PDR	Rec-05	Centre stack and solenoid insulation - Demonstrate the shear bond strength between the insulation and the copper by testing.	Chrzanowski	New primer is being developed by CTD- once completed, tests will be performed to determine shear bond strength. Note: Date Ref #'s 201004-14, 201006-13, and 201006-24 are all related. See 201006-13 for details.		CLOSED
201006-25	June 2010 PDR	Rec-06	Structural Design – Define R&D goals, document, and carryout a supporting R&D program for all components and processes to support the design and its requirements and to reduce program risk	Chrzanowski	Will generate an R&D plan that lays out desired R&D, requirements, test plans.	Draft plan issued July 2010.	CLOSED

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201006-26	June 2010 PDR	Rec-07	Tile Design - Define the requirements for the tile design. Continue development of the tile design to meet the requirements. Examine attachment schemes and experiences on other fusion devices.	Tresemer	Concur. Will address this issue and show comparisons between present design and other fusion devices.	(9/14/10) 'Open, but will be addressed and resolved during the final design period, with results presented at the FDR. (6/6/11) See above comment for Chit-11 (201006-11). Established during the April 19, 2011 peer review that this design meets project requirements as stated in the GRD.	CLOSED
201006-27	June 2010 PDR	Rec-08	It is understood why the second beamline controls and acquisition system will initially use CAMAC as one of its elements, but we strongly encourage the incorporation of replacement technology as soon as possible.	Stevenson	Will consider but not required for initial operations. Existing channels and spares are adequate.	NSTX Ops may reconsider at a later date.	CLOSED
201006-28	June 2010 PDR	Rec-09	As soon as possible but no later than 4 weeks before Lehman review, finalize budget profile with DOE, and incorporate that profile into the project baseline.	Strykowsky	ongoing discussion underway with DOE to confirm guidance.	ongoing discussion underway with DOE to confirm guidance.	CLOSED
201006-29	June 2010 PDR	Rec-10	Consider forming a single project management advisory committee that fulfills both recommendations from the Lehman review and the PU Advisory Board.	Strykowsky	We are establishing an independent Project Management Advisory Committee (PMAC) to provide us guidance on project management matters. a proposed charter for this committee has been issued for review	in place	CLOSED
201006-30	June 2010 PDR	Rec-11	Assure that all Job Managers show ownership of their scope, cost, and schedule by communicating their WAF content and obligations at next Lehman review.	Strykowsky	Job manager training and reviews underway.	4/29/11 - EVMS training will re-reinforce ongoing .	CLOSED
201006-31	June 2010 PDR	Rec-12	Consider rolling up basis of estimates at Lehman review, to help communicate project maturity and confidence level of the estimates.	Strykowsky	WAF"s will be review, results tabulated and presented at the August Lehman review.		CLOSED
201006-32	June 2010 PDR	Rec-13	Evaluate current risk registry and attempt to make more pro-active mitigation strategies.	Strykowsky	The RR will be reviewed and mitigation plans expanded.	4/29/11 - Updated and posted for the Lehman review	CLOSED
201006-33	June 2010 PDR	Rec-14	Consider changing name “Risk Management” to a “Risk & Opportunity” Management, to encourage cost reduction ideas, integrated into WAFs and registry.	Strykowsky	Will revise	Have considered and opportunities have been and will continue to be identified. No need to change the description.	CLOSED
201006-34	June 2010 PDR	Rec-15	Continue implementing the detailed forward-looking (3-6 months out) staffing plan at all times.	Strykowsky	The resource loaded schedule will be updated to reflect names of engineers and designers at least through the FDR	Complete	CLOSED
201006-35	June 2010 PDR	Rec-16	Continue to regularly communicate the benefits of executing an advance procurement plan associated with the proposed CD-3a. This will save money and reduce risks.	Strykowsky	Will be the focus of the next telecom/communication with OFES	process established	CLOSED
201008-01	August 2010 Lehman CD-2	2.1-1	MAGNETS & CORE (Brad Nelson): Convene external peer reviews / verification of key aspects of the design and analysis, especially the TF joint electrical design and the algorithms to be used for the digital coil protection system, prior to the Final Design Review (FDR)	Dudek	Current plan is complete external peer reviews / verifications by the end of March 2011.	5/3/11 - External Reviewers are invited to the May 18th Peer Review to provide input on these design aspects. EIR was held October 2010.	CLOSED
201008-02	August 2010 Lehman CD-2	2.1-2	MAGNETS & CORE(Brad Nelson): Develop a plan for operating instrumentation to monitor selected displacements, temperatures and joint resistance, prior to the FDR.	Atnafu	Currently working with Jim Chrzanowski to develop a plan. (9/15/11) A plan was developed and estimated to add instrumentation to monitor selected displacements and joint resistances. The cost to implement such a plan (>$300) was not considered to be the best value option at this time. Instead an inspection plan is being developed to periodically monitor the joints and other areas of the machine that are considered to be of concern.	(5/3/11) This work has been assigned to Neway Atnafu to develop a plan and estimate to add some instrumentation to the Flex connectors and some support structure locations.	CLOSED

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201008-03	August 2010 Lehman CD-2	2.1-3	MAGNETS & CORE(Brad Nelson): Refrain from placing contracts for the conductor until after the stir welding processes evaluation has been satisfactorily completed and found to meet mechanical and electrical requirements for the joint design.	Chrzanowski	Concur	Friction Stir Welding trials are completed with successful results. Currently waiting for final report. A Peer Review will be held to evaluate the results prior to placing any contracts for the conductor.	CLOSED
201008-04	August 2010 Lehman CD-2	2.1-4	MAGNETS & CORE(Brad Nelson): Refrain from placing contracts for the PFC tiles until after the prototyping of the tiles and mechanical testing of the fastening scheme is completed.	Tresemer	Concur	(9/14/10) 'Open, a prototype is in progress. it will be addressed and resolved during the final design period, with results presented at the FDR. (6/6/11) Prototype is in progress and will be completed prior to placing any contracts for PFCs.	CLOSED
201008-05	August 2010 Lehman CD-2	2.2-1	NEUTRAL BEAM (M. Wade): Re-evaluate costs, possibly with independent review (prior to CD-2)	Stevenson	REQUIRED FOR CD-2 Proposed plan: 1) Prepare Charge questions and establish tentative date for a site review 2) Establish review team (2-3 individuals) to participate in a detailed C&S review of the neutral beam scope. 3) post all relevant technical, cost and schedule detail on the NSTX-U web site. 4) Review team and PPPL submit and respond to questions prior to a site visit. 5) review team visit PPPL wo/9/13 for 2 days to walk down the facility, review design and analyses, review detailed cost and schedule estimates. 6) Review team submit closeout report answering charge question by the end of the review.	(10/25/10) External Independent Review held at PPPL to review NBI and some CS cost estimates. EIR conducted October 2010. EIR recommended adding to base cost and contingency in a few select areas. EIR otherwise endorsed NBI cost estimates, basis, and contingency. See closeout report. Recommendations included in WAFs.	CLOSED
201008-06	August 2010 Lehman CD-2	2.2-2	NEUTRAL BEAM (M. Wade): Make a mock-up of vessel and perform test cut; perform analytical calculations on vessel structure response to planned cuts in vessel wall	Stevenson	(10/25/10) VV mockup for cutting and welding is being prototyped. Measurements of deflections will be performed during test cuts.	(10/25/10) Testing in progress. Confirmed as closed via conversation with Tim Stevenson on 8/10/11.	CLOSED
201008-07	August 2010 Lehman CD-2	2.2-3	NEUTRAL BEAM (M. Wade): Perform a leak check of vacuum weld of beamline interface prior to next step in assembly of beamline.	Stevenson	(10/25/10) Vacuum weld will be on the inside of the vacuum vessel and only accessible from the interior. It is not impacted by the assembly of the beamline. The weld will be leak checked when the vessel can be closed up and evacuated. The weldment and external duct pieces will be leak checked prior to assembly. The entire VV will undergo vacuum leak checking during assembly. The weld will still be accessible after machine assembly if repairs are needed prior to operations.	(10/25/10) Requires an assembly and test plan - TBD. Confirmed as closed via conversation with Tim Stevenson on 8/10/11.	CLOSED
201008-08	August 2010 Lehman CD-2	2.3-1	ANCILLARY SYSTEMS (McManamy): Conduct a design review of the Digital Coil Protection system with external reviewers to include consideration of the coil current combinations, analysis of the loads and overall system design including software and reliability requirements for all components and instrumentation prior to the Final Design Review in 2011	Ramakrishnan		(9/21/10) In progress, to be completed prior to the FDR. (9/20/11) A PDR of the DCPS was conducted on 6/17/11 with an external reviewer.	CLOSED
201008-09	August 2010 Lehman CD-2	3.0-1	COST,SCHEDULE,FUNDING (K.Chao): Reassess the cost and schedule estimate and contingency Prior to CD-2 approval	Strykowsky	REQUIRED FOR CD-2 An EIR will be conducted for the Neutral beam scope)fabrication, assembly and power systems). Detailed cost and schedule being updated. Discussions with OFES required to establish desired contingency levels.	3/1/11 - Closed by R Strykowsky	CLOSED
201008-10	August 2010 Lehman CD-2	3.0-2	COST,SCHEDULE,FUNDING (K.Chao): Re-evaluate the annual allocation of cost contingency Prior to CD-2 approval	Strykowsky	REQUIRED FOR CD-2 Detailed cost and schedule being updated.	3/1/11 - Closed by R Strykowsky	CLOSED
201008-11	August 2010 Lehman CD-2	3.0-3	COST,SCHEDULE,FUNDING (K.Chao): Update the risk registry Prior to CD-2 approval	Strykowsky	REQUIRED FOR CD-2 Mitigation plans will be expanded in the RR.	3/2/11 - Closed by R Strykowsky. Updated ref http://nstx-upgrade.pppl.gov/index.htm	CLOSED
201008-12	August 2010 Lehman CD-2	3.0-4	COST,SCHEDULE,FUNDING (K.Chao): Approve CD-3a after completion of the appropriate design and analysis activities.	Makiel		Closed - The intent was to obtain a "authorization letter" to allow approvals. This was not approved and approval with the sponsor will occur on an "as needed" basis	CLOSED

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201008-13	August 2010 Lehman CD-2	5.0-1	Management/ES&H (E.Lessard): Ensure the rules in contract (e.g., Conduct of Operations, 10CFR851) are addressed in design review process, PPPL controlled documents, training and practices	Levine		This is already being done in accordance with PPPL policies, procedures and plans. For example, the requirements of 10CFR851 are addressed in the DOE approved PPPL "Worker Safety and Health Program", which includes references to Laboratory policies, procedures and plans that implement each requirement in 10CFR851.	CLOSED
201008-14	August 2010 Lehman CD-2	5.0-2	Management/ES&H (E.Lessard): PPPL managers should consider QA program to address whether or not procedures are being implemented as intended	Levine		PPPL has a QA Program documented in the DOE approved Institutional QA Program (EQP-004), which addresses procedure implementation and other quality requirements. Specific PPPL policies and procedures and processes such as the STOP Program include elements of procedure implementation review.	CLOSED
201008-15	August 2010 Lehman CD-2	5.0-3	Management/ES&H (E.Lessard): PPPL and DOE should determine and agree upon an authorization basis and readiness review pathway and then complete the Hazards Analysis Prior to CD-2 approval	Levine		Complete	CLOSED
201008-16	August 2010 Lehman CD-2	6.0-1	MANAGEMENT (J.Haines): Revise PEP to clearly define project completion criteria and delete unnecessary details Prior to CD-2 approval	Strykowsky	REQUIRED FOR CD-2 The PEP will be revised and submitted for internal and external review prior to signoff.	3/1/11 - Closed by R Strykowsky	CLOSED
201008-17	August 2010 Lehman CD-2	6.0-2	MANAGEMENT (J.Haines):Issue Hazard Analysis Report Prior to CD-2 approval	Levine	REQUIRED FOR CD-2	Complete	CLOSED
201008-18	August 2010 Lehman CD-2	6.0-3	MANAGEMENT (J.Haines): Reevaluate cost contingency and schedule contingency Prior to CD-2 approval	Strykowsky	REQUIRED FOR CD-2 Detailed cost and schedule being updated. Discussions with OFES required to establish desired contingency levels.	3/1/11 - Closed by R Strykowsky	CLOSED
201008-19	August 2010 Lehman CD-2	6.0-4	MANAGEMENT (J.Haines): Consider revising the budget profile to spread more contingency to the early years Prior to CD-2 approval	Strykowsky	REQUIRED FOR CD-2 Detailed cost and schedule being updated.	3/1/11 - Closed by R Strykowsky	CLOSED
201008-20	August 2010 Lehman CD-2	6.0-5	MANAGEMENT (J.Haines): Perform focused cost reviews of the major cost drivers Prior to CD-2 approval	Strykowsky	REQUIRED FOR CD-2 An EIR will be conducted for the Neutral beam scope)fabrication, assembly and power systems). Detailed cost and schedule being updated. Discussions with OFES required to establish desired contingency levels.	ear conducted October 7&8,2010	CLOSED
201008-21	August 2010 Lehman CD-2	6.0-6	MANAGEMENT (J.Haines): Acquisition Executive and Federal Project Director should develop a process to approve long lead procurements and early start activities Prior to CD-2 approval	Strykowsky	REQUIRED FOR CD-2	Process established	CLOSED
201008-22	August 2010 Lehman CD-2	6.0-7	MANAGEMENT (J.Haines): After CD-2:Conduct periodic PPPL project peer reviews	Strykowsky	Peer reviews will be conducted as part of the final design review process. A technical and project management advisory committee will be established to periodically review the progress of the project.	3/1/11 - Closed, NBI peer review held April 19th, CS peer review planned May18	CLOSED
201010-01	October 2010 EIR	Rec-01	(Cowell, M) WBS 1.8-Maintain / advance design development so that down stream critical path activities (like WBS 1.8) can better define scope, activity detail and risks.	Strykowsky	Concur. Will factor in design maturation into the field ETC	4/29/11 - Perry and Viola are updating their ETC's based on our design maturity and will be presented at the FDR in June	CLOSED
201010-02	October 2010 EIR	Rec-02	(Cowell, M) WBS 1.8-EVMS Validation – start early	Strykowsky	Concur. Pre-Validation tasks begun. Procedures being updated, training scheduled for 10/27,EVMS statusing begun.	4/29/11 - Implementation started. Formal training started, GAP analysis conducted, PMSD being revised	CLOSED

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201010-03	October 2010 EIR	Rec-03	(Cole, M) WBS 1.1.3-Review tooling cost for Center Stack assembly and revise if warranted.	Chrzanowski	Concur. WAF to be updated.		CLOSED
201010-04	October 2010 EIR	Rec-04	(Cole, M) WBS 1.1.3-Consider having fewer reviews but longer durations	Strykowsky	Concur for the review under the project's control.. Future review will allocate sufficient time for more in-depth assessments.	4/29/11 - June FDR will be 3 instead of 2 days	CLOSED
201010-05	October 2010 EIR	Rec-05	(Bellomo, P) WBS 1.5-Significantly more emphasis is needed in the design of a facility earth mesh (grounding) system. It is noted that the upgrade will increase power converter operating currents and magnetic fields. This is an opportunity to correct the observed deficiencies in the present system. The effort can be led by the Power Systems Job Manager, but must also include other disciplines as well.	Ramakrishnan	Disagree. Mesh grounding incompatible with Tokamak operation. . Tokamak grounding is a unique art/science, much different than accelerators. Single point grounding is essential. Separation of power and diagnostic grounds is the key feature to avoiding noise problems. On NSTX the complexity is compounded by the CHI requirement for biasing the inner and outer VV. Anyway it is true that we have multiple ground systems in the NSTX test cell but only the basic facility ground matters when people have access because all other sources are isolated prior to access. There is no safety issue. And, the rest of the facility, outside of the test cell, uses a highly meshed grid which is more per conventional practice and aligned with industrial standards. We are having a very safe facility with grounding installed as per IEEE standards - in operation for nearly three decades. Also in 1984 our grounding system was tested by an outside agency and declared to be in order. Single point grounding is a must. During the design of NCSX we had to remove the mesh to avoid loops - based on detailed analysis and calculations. How ever some changes to		CLOSED
201010-06	October 2010 EIR	Rec-06	(Bellomo, P) WBS 1.5-Prior to (say one month before) the planned shutdown, as part of the ARR, all Job Managers must declare all materials are on hand, and account for them.	Ramakrishnan	Agree in principle. Will schedule within schedule priority and available funding. Sub-contract for installation will be awarded only after the receipt of all the materials	PPPL procedures are prepared such that all the materials are identified / ready prior to the job.	CLOSED
201010-07	October 2010 EIR	Rec-07	(Bellomo, P) WBS 1.5-Because the installation is complex, prior to shutdown, identify an Installation Manager and imbue with full authority to manage the installation. During the installation phase all Job Managers report to the Installation Manager.	Ramakrishnan	Concur. The Upgrade project deputy project manager will be the construction coordinator. Work will be control daily via a work control center.		CLOSED
201010-08	October 2010 EIR	Rec-08	(Bellomo, P) WBS 1.5-Include contingency quantities for components or equipment that are long lead, critical for the first plasma milestone, critical for subsequent operation on, and/or are one-of-a kind.	Ramakrishnan	The DC CLR for OH will be ordered giving sufficient time for delivery.	The design was changed so that the DC CLR for the OH was no longer needed.	CLOSED
201010-09	October 2010 EIR	Rec-09	(Bellomo, P) WBS 1.5-Permit Power System installation as soon as possible to minimize interferences, escalation of cost of materials, escalation of cost of labor.	Ramakrishnan	Agree in principle. Will schedule within schedule priority and available funding allowing ample free float. . Project Manager is requested to allow installation activities to begin six months earlier than currently planned.	Will be built into schedule with Job 5000	CLOSED
201010-10	October 2010 EIR	Rec-10	(Bellomo, P) WBS 1.5-Neutral Beam PS high voltage triaxial accel cable is special, long lead and has only one supplier. Suggest this be added to list of components to be purchased as soon as possible.	Ramakrishnan	Agree in principle. Will schedule within schedule priority and available funding allowing ample free float. Project Manager is requested to allow procurement of Triax to begin in January 2012	The Triax cable has been ordered.	CLOSED
201010-11	October 2010 EIR	Rec-11	(Tooker, J & Kellman, A) WBS 1.2.4-Beamline Services: review contingency applied to the installation tasks. Some runs are complicated routes that pass through congested areas which will impede access and likely increase time and effort to perform these tasks.	Denault	Concur. Additional contingency will be added.		CLOSED
201010-12	October 2010 EIR	Rec-12	(Tooker, J & Kellman, A) WBS 1.2.4-NBI Power Systems: review effort and contingency for reactivation of the power supplies. They have been mothballed for more than a decade and will not reawaken easily.	Ramakrishnan	Concur. WAFs will be revised to reflect the comments		CLOSED
201010-13	October 2010 EIR	Rec-13	(Tooker, J & Kellman, A) WBS 1.2.4-NBI Power Systems & Control: review and update the effort and durations for the subsystem testing and full system integration tests. First time that newly installed upgrades (those already in power supplies of NB1) plus reawakened subsystems have been fully restored to operation and likely to have issues.	Ramakrishnan	Concur. WAFs will be revised to reflect the comments		CLOSED

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201010-14	October 2010 EIR	Rec-14	(Tooker, J & Kellman, A) WBS 1.2.4-NBI System: project is complete when 40 keV beam has been produced—effort to achieve this needs to be reviewed and likely updated; decision on where covered.	Stevenson	Concur. a separate task will be added (probably in controls or in its own job) for commissioning, preoperational testing, and initial conditioning of 4ABC	Based on the need to start up the system using existing preoperational and operations procedures with the cryogenics, mechanical support, and controls in conjunction with BL1 startup, the funding for this activity will be provided in the normal NSTX NB operations job which will be adjusted accordingly. The milestone will be retained by the project and verified complete based on CD4 requirements in the PEP.	CLOSED
201010-15	October 2010 EIR	Rec-15	(Tooker, J & Kellman, A) WBS 1.2.4-NBI Duct & Vacuum Vessel Mods: procure rectangular bellows as early as possible to prevent this procurement from developing into a schedule issue.	Stevenson	Agree in principle. Will schedule within schedule priority and available funding allowing ample free float. The procurement schedule will be adjusted to allow for additional free float.	4/27/11 - Concur in principle. The bellows will either be fabricated at PPPL or procured from vendor early in the project procurement cycle as soon as practicable after CD3 approval. Confirmed as closed via conversation with Tim Stevenson on 8/10/11.	CLOSED
201103-01	March 2011 DCPS CDR	Chit-01	The DCPS does not address the use of fiber-optic sensors to monitor the stress/strain and temperature of actual coils. It would be foolish to repeat the mistakes of the TF joint problems. Fiber-optic sensor installation affects the actual design of the coil/center stack. These fiber-optic signals could greatly benefit the DCPS.	Hatcher	This chit was considered out of scope for this review since no direct coil stress monitoring has been prescribed in the center stack design. However, analog inputs to the DCPS are available if needed to validate engineering models	Out of scope - Not required for the NSTXU project.	CLOSED
201103-01	March 2011 MPTS Peer Review	Peer-01	(Denault, M.) Dump tube may interfere with the beam maintenance. Rotate both 90's and run dump along NB2. Possibly extend length to end of new platform.	Labik	Concur. George Labik to consider (Out of scope for NSTXU)	The run of the laser beam dump tube shown at the PDR is modified to extend upward, then due west and then due south adjacent to the third level platform. It does not interfer with a NB 2 TIV lift , is accessable from the second & third level platform, the high point will be below an El of 122 ft needed for NB calorimeter lift clearance and provides greater than 25 ft total length to satisfy a 50 ns delay in reflected light from the dump window.	CLOSED
201103-02	March 2011 DCPS CDR	Chit-02	Would be good if there is an easily understood post-processor to quickly determine in the control room why a level 1 fault was issued. COE needs to be able to determine what "broke"	Stevenson	Concur. Action: R. Hatcher to consider	The DCPS will annunciate through GUI and through EPICS to COE At present the GUI has been delayed. The DCPS annunciates a fault to the Hardware Interface. The DCPS engineer will have to evaluate the HI panle and the parameter tree. Additional annunciation will be added for Ops..	CLOSED
201103-02	March 2011 MPTS Peer Review	Peer-02	(Bell, R.) Consider putting the vacuum window at the lase dump at Brewster's angle. This would virtually eliminate background reflection.	Labik	Concur. George Labik to consider (Out of scope for NSTXU)	The NSTXU laser delivery optics will have a beam dump within vessel vacuum which eliminates the need for a window. It is worth noting that while the Nd:YAG laser beams are nominally vertically polarized, it is not unlikely that their polarization be slightly off, in which case a Brewster window angle would be less useful.	CLOSED
201103-03	March 2011 DCPS CDR	Chit-03	Why are we using NI digitizers for inputs. We have qualified the FPDP data stream, with SADS, in the NSTX environment. We have also developed computing methods with ACQ & PCS. Shouldn't we take advantage of this experience.	Hatcher	Commercially "standard" approaches were found to be adequate for this application. Action: J. Lawson to evaluate further and review with the IT Division.	The NI system is “off the shelf”, offers comparatively advantageous I/O options, and limits the possible faults scenarios when compared to using the existing I/O scheme. (Taken from the Digital Coil Protection System PDR PowerPoint presentation by Ron Hatcher dated June 17, 2011).	CLOSED
201103-03	March 2011 MPTS Peer Review	Peer-03	(Chrzanowski, J.) Generate a requirements document that will be the basis for the design of the MPTS. This will be under document control.	Labik	Concur.: Requirements will be generated and approved prior to PDR	General requirements document has been created and approved.	CLOSED
201103-04	March 2011 DCPS CDR	Chit-04	The protection list should identify and include the weakest link in the power loop (not just the coil itself)	Hatcher	The design of the DCPS focuses on machine protection and assumes that local systems protect components in the power loop. Action: R. Hatcher to consider.	The DCPS focuses on machine protection and assumes that local systems protect power-loop components (may consider as a future expansion in capabilities). (Taken from the Digital Coil Protection System PDR PowerPoint presentation by Ron Hatcher dated June 17, 2011).	CLOSED
201103-04	March 2011 MPTS Peer Review	Peer-04	(Chrzanowski, J.) Perform analysis of shifted port location and the effect on the VV.. Present analysis at PDR	Labik	Concur will present analysis results at PDR	An analysis based on increasing the thickness of the VV on both the air and vacuum side as well as using bridging bars across the K L & A ports was part of the presentation material but other issues cut the Peer Review short. The analysis was presented at the PDR.	CLOSED
201103-05	March 2011 DCPS CDR	Chit-05	Can we provide additional instrumentation to validate engineering models.	Hatcher	Similar to Chit#1.	Out of scope - Not required for the NSTXU project.	CLOSED

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201103-05	March 2011 MPTS Peer Review	Peer-05	(LeBlanc, B.) Set the distance (vertical) between the laser beams and the in-situ illumination probe in order to make it possible to install a moisture probe.	Labik	Concur. George Labik to consider	The distance between the centerlines of the laser input and calibration probe is 5 inches in the current design . This is sufficient if reusing the existing probe and just supplying a drive system (Liter Probe without a bellows and vacuum flanges or a Bi Slide system) . If the existing calibration probe is replaced by a Liter type design (bellows and vacuum flanges included), then added space would be required to install it upside down and directly over the laser flight tube. George Labik and Ben LeBlanc have been looking into the problem. It is likely that a Thermionics translator model ZC will be used, with modifications similar to the LITER. A vertical gap of 6 inches between the laser flight tube axis and the in-situ illumination probe translator axis would be required in order to permit the implementation of a Thermionics translator.	CLOSED
201103-06	March 2011 DCPS CDR	Chit-06	A permissive is to be provided to FCPC rectifier circuits to insure DCPS is ready.	Hatcher	Concur, but believe that the DCPS output serves both as a permissive and a fault signal. Action: R. Hatcher to evaluate.	The DCPS uses a fail-safe fault line which also acts as a permissive to the system. (Taken from the Digital Coil Protection System PDR PowerPoint presentation by Ron Hatcher dated June 17, 2011).	CLOSED
201103-06	March 2011 MPTS Peer Review	Peer-06	(LeBlanc, B.) The current collection optics is well focused for larger major radii, but is focused too close for the region near the centerstack. We intend to work on this problem during the May in-vessel work.	Labik	(Out of scope for NSTXU)	This should have no impact on the laser beams VV interface but will impact the Optics box design modification and should be evaluated as soon as entry to the VV is permitted	CLOSED
201103-07	March 2011 DCPS CDR	Chit-07	Provide a list of DCPS inputs and outputs from and to the DCPS.	Hatcher	Concur. Action: R. Hatcher to provide for the PDR.		CLOSED
201103-07	March 2011 MPTS Peer Review	Peer-07	(Strykowsky, R.) Update WAF to reflect total scope consistent with requirement. Provide by April 1st.	Labik	Concur- George to meet with Ron S.	Done	CLOSED
201103-08	March 2011 DCPS CDR	Chit-08	Software requirement: Regression testing and models or simulator should be available to validate the vast number of coefficients and settings.	Stevenson	Concur. Simulation tests to be developed for all inputs. Action: R. Hatcher	Regression testing, pre-operational testing, explicit test input files, integrated system testing, and operations procedures will be employed. In progress by Test Director. See PTP-DCPS-001 documentation.	CLOSED
201103-09	March 2011 DCPS CDR	Chit-09	The conceptual hardware/computing block diagram, the proposed implementation, is a questionable approach. Consider a separate discussion of approaches (VME, SAD, LabView RT/FPGA)	Hatcher	Agreed. Action: J. Lawson to discuss with IT	It was determined that the present design had some advantages over other choices (e.g., VME, SAD, LabView, RT/FPGA, d-tacq) but that we would continue to consider all technologies as we optimized the design during the final design process. (Taken from the Digital Coil Protection System PDR PowerPoint presentation by Ron Hatcher dated June 17, 2011).	CLOSED
201103-10	March 2011 DCPS CDR	Chit-10	This will be the most critical system on the lab network. Address the cyber security plan in the PDR. The dire consequence of unauthorized code changes warrant this topic be addressed. Consider not having this system on the network.	Hatcher	Concur. Action: J. Lawson	The plan is to keep the DCPS “nominally” off the network with the exception of data transfers to a gateway computer for data acquisition purposes. (Taken from the Digital Coil Protection System PDR PowerPoint presentation by Ron Hatcher dated June 17, 2011).	CLOSED
201103-11	March 2011 DCPS CDR	Chit-11	PCS & PSC (PSRTC) traditionally have provided computations to "back-up" the hardware protection systems. Will the DCPS place similar new requirements on PCS/PSC? Will the existing PSC protective algorithms require any changes for DCPS?	Hatcher	No impact to PCS is expected, but will possible affect PSC (PSTRC). Action: R. Hatcher to coordinate with IT.	No changes are anticipated for PCS. Any changes to PSRTC (most likely reduced responsibilities) will be coordinated with IT. (Taken from the Digital Coil Protection System PDR PowerPoint presentation by Ron Hatcher dated June 17, 2011).	CLOSED
201103-12	March 2011 DCPS CDR	Chit-12	Clarify what changes to PSRTC will happen due to the DCPS installation. Document changes and inform people.	Hatcher	See Chit #11	No changes are anticipated for PCS. Any changes to PSRTC (most likely reduced responsibilities) will be coordinated with IT. (Taken from the Digital Coil Protection System PDR PowerPoint presentation by Ron Hatcher dated June 17, 2011).	CLOSED
201103-13	March 2011 DCPS CDR	Chit-13	Consider adding supplemental DAC outputs for the real time or CAMAC digitizers. For post-mortem analysis or for alerting PCS/PSC if status in real time.	Hatcher	Concur. Action: J. Lawson to consider in preparing preliminary design.	Will be part of the final design. (Taken from the Digital Coil Protection System PDR PowerPoint presentation by Ron Hatcher dated June 17, 2011).	CLOSED

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201103-14	March 2011 DCPS CDR	Chit-14	The PDR should address test and validation of the system.	Hatcher	Concur. Action: R. hatcher	Concur, details to be presented at the PDR .	CLOSED
201104-01	April 2011 NBIU Peer Review	Peer-01	Flux weld out gassing properties should be documented and evaluated for use in high vacuum.	Denault		Ongoing. Preliminary test show that flux cored wire is acceptable for use in a high vacuum environment. Further testing continues for actual NSTX conditions. (From slides 87 of Martin Denault's Neutral Beam Upgrade PowerPoint presentation dated June 22-24, 2011 presented at the NSTXU FDR).	CLOSED
201104-02	April 2011 NBIU Peer Review	Peer-02	A roughing valve should be added to pump the NSTX vessel.	Blanchard	Roughing valve will be included on TVPS for the vacuum vessel.		CLOSED
201104-03	April 2011 NBIU Peer Review	Peer-03	A section should be added to the FDR presentations on contamination control. Explain what measures will be taken, using examples/experience where applicable.	Stevenson			CLOSED
201105-01	May 2011 CSU Peer Review	Peer-01	(Strykowsky, R.) The intent of this review was to focus on the technical design. However, prior to the FDR we should schedule an assembly review. Target week of May 23rd.	Perry	Concur	Completed as part of the FDR presentations	CLOSED
201105-01	May 2011 MPTS PDR	Chit-01	(Bell, M.) Impact of proposed double layer cap over Bay L-K cutout on penetration of fields from non-axisymmetric error field coil must be examined.	Labik		The double wall reinforcement design presented at the PDR was replaced with a limited number of thick SS bars both in vacuum and in air, welded to the vessel shell and Bay L cap. J. Bialek, along with equlibria definition runs furnished by S. Gerhardt, is in the process of evaluating the new design's impact upon the RWM coils performance.	CLOSED
201105-02	May 2011 CSU Peer Review	Peer-02	(Gentile, C) A resolution of increased production, and the introduction of additional G-10 and new insulating materials, what is the activation profile and post pulse? Has analysis been performed to evaluate if we will stay below a Cat 3 nuclear facility during NSTX operations?	Dudek	Concur. Action: Revise SAD as required.	Due date: Jun 10, 2011. In Progress: 5/23 Sent email to J. Levine to respond to the chit. (6/27/11) REVISED Memo issued by Levine with an addendum to the 2009 NSTX Upgrade Project Nuclear Facility Assessment that was prepared to address a chit at the CSU FDR on potential impacts of activation of the CTD-425 resin. Other materials were addressed in the original assessment	CLOSED
201105-02	May 2011 MPTS PDR	Chit-02	(Bell, M.) Present design provides view ports for NBI armor and RF antenna for IR camera. Recommend adding view ports for NSTXU NBI armor and RF antenna on the proposed design for Bay L cap.	Labik		4 5/8 CF flanges were added to view the RF antenna and NB armor.	CLOSED
201105-03	May 2011 CSU Peer Review	Peer-03	(Strykowsky, R) Not clear whether the outstanding chits have been dispositioned/closed for the design and manufacturing of the center stack. Update the NSTX-U chit log.	Dudek	Concur. Action: Revise SAD as required.	Closed 5/25/11. All chits have been added to chit log	CLOSED
201105-03	May 2011 MPTS PDR	Chit-03	(Johnson, D.) Consider rotating the optics box around a point defined by the intersection of the old and new laser lines, possibly using a new intermediate base plate. If pursued, assess vignetting.	Labik		Rotating the optics box is not straightforward because of the proximity of the TF coil between bays E and F. We are considering an equivalent modification, where the optics-box east wall would be moved out between 0.5 to 1 inch. The new wall would be textured to reduce grazing incidence reflection. Furthermore the mirror could then be moved towards the east while keeping its center of curvature at the original location, i.e. the center of the aperture stop.	CLOSED

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201105-04	May 2011 CSU Peer Review	Peer-04	(Ramakrishnan, R) Perform force calculations for the TF bus	Dudek	Concur. Action: Revise SAD as required. WBS 1.5.5 Structural Analysis of PF1, TF & OH Bus Bars NSTXU-CALC-55-01 Prepared By: Andrei Khodak Reviewed by Peter Titus Cognizant Engineer: Mark Smith	Completed see WBS 1.5.5 Structural Analysis of PF1, TF & OH Bus Bars. NSTXU-CALC-55-01 Prepared By: Andrei Khodak. Reviewed by Peter Titus, Cognizant Engineer: Mark Smith. Three-dimensional numerical simulations of PF1, TF, and OH bus bars were performed using ANSYS coupled solver for simultaneous structural, thermal and electromagnetic analysis. Thermal and electromagnetic simulations supported structural calculations providing necessary loads and strains. Simulations were performed during design process to verify structural integrity. The purpose of this calculation was to perform Structural Analysis of PF1, TF, and OH bus bars and to document the results. The following parts of the coil assembly are included in the analysis: P1A,B,C upper and lower bus bars with flags supports and parts of coil assembly OH bus bar together with coaxial part TF bus bars with supports and parts of connecting structure Remaining NSTX PF coils are modeled as current source elements, NSTX TF coils are modeled as current source elements within the center stack, and as solid elements at the periphery Constant elevated temperatures were imposed according to the analytical heat transfer calculations. Reference	CLOSED
201105-04	May 2011 MPTS PDR	Chit-04	(Titus, P.) AWS does not allow intermittent welds for cyclically loaded built-up members.	Labik		The current design eliminates the added wall thickness and skip and plug welds. However the reinforcement bars will have a 1/2 inch deep partial penetration butt weld for the entire perimeter except for a 3/8 inch open section at the bottom of the bars to avoid trapping air.	CLOSED
201105-05	May 2011 CSU Peer Review	Peer-05	(Ramakrishnan, R) Ground the additional supports for the PF 4/5	Smith	Concur	Completed. Ground wire installed. Refer to CAD model / drawings.	CLOSED
201105-05	May 2011 MPTS PDR	Chit-05	(Dudek, L.) Careful consideration to the weld detail must be given to prevent the possibility of debris trapped behind the plates becoming a gas source that cannot be cleaned up. Needs to be weighed against leak testing.	Labik		See comments in Chit 4 (Titus). A glove box equivalent can be constructed around the in vacuum bars so that the wall and bar interface can be kept clean during the welding process. A small root pass (seal) weld should be applied at the top, sides and part of bottom. After the seal welds are completed the glove box can be eliminated and the structural welds completed.	CLOSED
201105-06	May 2011 CSU Peer Review	Peer-06	(Labik, G) TF wedge and flex joint - ensure that the compressive load is not compromised by the difference in the coefficient of thermal expansion between the 718 Inconnel fasteners and the copper. The issue is the electrical conductivity of the joint which required sufficient compressive load be maintained.	Dudek	Concur. Action: Revise SAD as required. See chit Peer-12 (201105-12). NSTXU-CALC-132-06-00 The results of the ANSYS multiphysics finite element analysis - electric, transient thermal, magnetostatic, and static structural - show that: 1.) the maximum equivalent stress in the laminations is 27.5 ksi, which is 25.5 ksi below the fatigue allowable for the full-hard C15100 copper-zirconium strip; 2.) the maximum equivalent stress in the copper threads is 29.1 ksi, which is 32.9 ksi below the fatigue allowable for the full-hard C18150 copper-chromium-zirconium plate; 3.) the minimum average contact pressure is >6500 psi, and the minimum local contact pressure is >2500 psi, which is 1000 psi above the design goal; and 4.) the lamination minimum linear buckling load multiplier factor (LMF) is > 58, which is approximately 10x the minimum allowable specified in the NSTX Design Criteria document	CLOSED - See NSTXU-CALC-132-06-00 The results of the ANSYS multiphysics finite element analysis - electric, transient thermal, magnetostatic, and static structural - show that: 1.) the maximum equivalent stress in the laminations is 27.5 ksi, which is 25.5 ksi below the fatigue allowable for the full-hard C15100 copper-zirconium strip; 2.) the maximum equivalent stress in the copper threads is 29.1 ksi, which is 32.9 ksi below the fatigue allowable for the full-hard C18150 copper-chromium-zirconium plate; 3.) the minimum average contact pressure is >6500 psi, and the minimum local contact pressure is >2500 psi, which is 1000 psi above the design goal; and 4.) the lamination minimum linear buckling load multiplier factor (LMF) is > 58, which is approximately 10x the minimum allowable specified in the NSTX Design Criteria document	CLOSED
201105-07	May 2011 CSU Peer Review	Peer-07	(von Halle, A) Consider an additional cooling line to allow for 350 C diverter bakeout temperature without overheating the seals at the ceramic breaks.	Dudek	Not part of scope. Dudek to evaluate. Ref August Peer Review 2009 Closed – Thermal analysis has been completed and it was determined that additional cooling will be required in that area to protect the o-rings. Plans to provide additional cooling have been added to the NSTXU design.	Closed 5/25/11. This is being added to the design per discussion with Jim Chrzanowski on 5/20/2011.	CLOSED
201105-08	May 2011 CSU Peer Review	Peer-08	(Ramakrishnan, R) Review the flags required for bakeout of vessel	Chrzanowski	Concur	The flags were reviewed. It was determined that there was adequate copper area to carry the current.	CLOSED
201105-09	May 2011 CSU Peer Review	Peer-09	(Ramakrishnan, R) It will be desirable to show some slides from the general arrangement extract during discussions on assembly.	Perry	Concur	Completed as part of the FDR presentations	CLOSED

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201105-10	May 2011 CSU Peer Review	Peer-10a	(Ramakrishnan, R) Change the coil currents (PF) to reflect the latest values in design point spreadsheets.	Ramakrishnan	Concur		CLOSED
201105-11	May 2011 CSU Peer Review	Peer-10b	(Ramakrishnan, R) Make provisions to measure TF joint resistance (maintenance).	Chrzanowski	Concur: For future maintenance	It was determined working with R. Strykowsky and M. Williams that measuring the TF joint resistance was not required for the upgrade design.	CLOSED
201105-12	May 2011 CSU Peer Review	Peer-11	(Strykowsky, R) Controls - identify high leverage tasks to accelerate.	Sichta	Concur	On June 30, 2011 I e-mailed Strykowsky and listed PCS taskstasks (6100-0060, -0081) that should begin 6 weeks sooner to provide additional float to retire risk 6100d. EST. COMPLETION DATE: Oct 1, 2011	CLOSED
201105-13	May 2011 CSU Peer Review	Peer-12	(Perry, E) Where is the **proof** that the thermal excursions will not unload the inconnel nuts and studs that hold the copper flex and copper lead extensions of the center bundle?	Dudek		see chit 6 (201105-06) NSTXU-CALC-132-06-00 The results of the ANSYS multiphysics finite element analysis - electric, transient thermal, magnetostatic, and static structural - show that: 1.) the maximum equivalent stress in the laminations is 27.5 ksi, which is 25.5 ksi below the fatigue allowable for the full-hard C15100 copper-zirconium strip; 2.) the maximum equivalent stress in the copper threads is 29.1 ksi, which is 32.9 ksi below the fatigue allowable for the full-hard C18150 copper-chromium-zirconium plate; 3.) the minimum average contact pressure is >6500 psi, and the minimum local contact pressure is >2500 psi, which is 1000 psi above the design goal; and 4.) the lamination minimum linear buckling load multiplier factor (LMF) is > 58, which is approximately 10x the minimum allowable specified in the NSTX Design Criteria document	CLOSED
201105-14	May 2011 CSU Peer Review	Peer-13	(Perry, E) Since the new umbrella lids are not solid plates, a cover will need to be added on top to protect conductors whenever someone is working on top of the machine.	Perry	Concur	The procedures that require work on top of NSTX will be identified and updated to require the use of additional safety measures (i.e. adding a cover).	CLOSED
201105-15	May 2011 CSU Peer Review	Peer-14	(Perry, E) How will the centerstack need to be supported during the use of Aquapour to assure the shape that is required to produce an OH coil with the proper shape (avoiding distortions due to gravity).	Chrzanowski	Concur. Fixture will have midspan rollers to support the coil.	EST. COMPLETION DATE:	CLOSED
201105-16	May 2011 CSU Peer Review	Peer-15	(Perry, E) Need to incorporate lift points into the centerstack design.	Chrzanowski	Concur		CLOSED
201105-17	May 2011 CSU Peer Review	Peer-16	(Perry, E) Need to verify the reasonableness of the assumption that the inboard diverter tiles at the CHI gap will not see significant heating on both the horizontal and the vertical surfaces.	Tresemer	Concur	Email from Michael Bell indicating Larry Dudek and Kelsey Tresemer were consulted on this item. 8/24/11 - Chit reassigned to K. Tresemer per conversation with L. Dudek.	CLOSED
201105-18	May 2011 CSU Peer Review	Peer-17	(Perry, E) The risks for the tiles should be updated (as pointed out in the presentation).	Tresemer	Concur	Risks were updated during the June 2011 WAF revisions.	CLOSED
201105-19	May 2011 CSU Peer Review	Peer-18	(Perry, E) Michael Bell's approval must be obtained for the magnetic A193 bolts specified for the PF 4/5 supports.	Smith	Concur	Ongoing. Awaiting sample bolt for permeability test data. (9/16/11). Bolt was tested with a magnetic permeability of 1.01.	CLOSED
201105-20	May 2011 CSU Peer Review	Peer-19	(Perry, E) Details are needed for the bolted connections of the coil support structures, including connections to the test cell floor.	Smith	Concur	Ongoing Validation documents will be signed calculations	CLOSED
201105-21	May 2011 CSU Peer Review	Peer-20	(Perry, E) Prepare designs for the bus supports for all new bus runs.	Smith	Concur	N/A. Designs were prepared, though being finalized.	CLOSED

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201105-22	May 2011 CSU Peer Review	Peer-21	(Perry, E) Prepare designs for the cooling water needed for the new bus runs.	Afnafu	Concur	Ongoing. Water cooling designs planned. Discussed with Mark Smith on 5/10/13. This Chit has been reassigned to Neway Afnafu.	CLOSED
201105-23	May 2011 CSU Peer Review	Peer-22	(Perry, E) The Coil Protection System design needs to be brought up to a Final Design level.	Hatcher	Concur	(11/29/12) The Coil Protection System has been broken down into multiple scopes. There will be an FDR performed for each individual scope.	CLOSED
201105-24	May 2011 CSU Peer Review	Peer-23	(Perry, E) The MPTS relocation design needs to be brought up to a Final Design level.	Labik	Concur	The final design is underway. FDR planned for early Dec 2011.	CLOSED
201105-25	May 2011 CSU Peer Review	Peer-24	(Perry, E) The proposed MPTS flight tube above the second neutral beamline and the proposed MPTS beam dump location are not compatible with the designs for the second beamline cable trays / cryo lines and the new 118' EL platform on the west side of the test cell (for rack relocations).	Perry	Concur	The MPTS flight tube has been re-routed to avoid the conflict. This can be verified with George Labik.	CLOSED
201105-26	May 2011 CSU Peer Review	Peer-25	(Ramakrishnan, R) A clear space of about 5' is required to be reserved on the east side of the PCTS to enable the expansion of the PCTS when we go to a pulse period of 1200 seconds.	Dudek	Disagree - not in the cope of the Upgrade Project	I concur with the Review Board Recommendation. The disposition should be to close these as they are not within the scope of the NSTX Upgrade project.	CLOSED
201105-27	May 2011 CSU Peer Review	Peer-26	(Perry, E) The umbrella lid stress analysis needs to be re-done for the current lid design.	Titus	Concur	This is being addressed via CALC-12-07-00 titled "Umbrella Reinforcement Details".	CLOSED
201105-28	May 2011 CSU Peer Review	Peer-27	(Perry, E) Complete the checking and review of all calculations and analysis.	Titus	Concur		CLOSED
201105-29	May 2011 CSU Peer Review	Peer-28	(Perry, E) Prepare a clear, concise statement or short table that states that all of the analysis has been completed and checked and it supports the designs as being appropriate and sufficient.	Heitzenroeder	Concur	This has been done, and is being used to track weekly progress at the Wednesday meetings. Calculation spreadsheet which logs the status of the calculations supporting the NSTXU project is being maintained by O Guzman.	CLOSED
201105-30	May 2011 CSU Peer Review	Peer-29	(Ramakrishnan, R) Fault modes are required to be considered when analyzing bus bar supports	Afnafu	Concur	Fault modes will be used in final analysis. Discussed with Mark Smith on 5/10/13. This Chit has been reassigned to Neway Afnafu.	CLOSED
201105-31	May 2011 CSU Peer Review	Peer-30	(Ramakrishnan, R) Desirable to provide a shield for RWM coils.	Dudek	Disagree - not in the cope of the Upgrade Project. RWMredesign is not part of the upgrade project.	I concur with the Review Board Recommendation. The disposition should be to close these as they are not within the scope of the NSTX Upgrade project.	CLOSED
201105-32	May 2011 CSU Peer Review	Peer-31	(Daly, E - IO) Consider a load specification for each coil set if possible. Each analyst creates the EM and thermal loads from scratch (first principles) This could eliminate some inefficiencies and help with development of DCPS inputs.	Heitzenroeder	Concur. Action: Heitzenroeder to consider (with input from Neumeyer?)	This information is contained in C. Neumeyer's GRD and requirements Web site.	CLOSED
201105-33	May 2011 CSU Peer Review	Peer-32	(Daly, E - IO) CTD-425 is acceptable from the test data and calculations provided. For the FDR, this insulation performance should be described clearly.	Heitzenroeder	Concur	CTD is currently performing additional tests and these are scheduled for completion by 9/21.	CLOSED
201105-34	May 2011 CSU Peer Review	Peer-33	(Daly, E - IO) Peak stress (slide #32) in FSW joint is 124 mPa. This is compared to which allowable? Consider methods to reduce this peak value.	Heitzenroeder	Concur	The allowable (156 Mpa) is given on p. 79. Methods to reduce stress have been considered (such as radii changes) , but could not be implemented.	CLOSED
201105-35	May 2011 CSU Peer Review	Peer-34	(Daly, E - IO) In general, when identifying and comparing calculated values, compare them clearly to design requirements, such as an allowable stress. This will be helpful for the FDR calc summaries.	Heitzenroeder	Concur	Agree. Allowables are included in P. Titus' slide set (see pgs. 78 and 79) but in general this information should be given earlier in the presentation.	CLOSED
201105-36	May 2011 CSU Peer Review	Peer-35	(Heitzenroeder, P) Reduce I^2t to get T_{max} < 100C	Neumeyer	Concur. This refers to the TF Coil.	Short of reducing the mission objective for a 5 second plasma flat top, we cannot reduce I2t. For the design basis condition, including allowance for a power supply fault at end of TF flat top and L/R current decay, the TF inner leg conductor is <=100C except for the end regions where the current density peaks as it exits the inner leg and enters the flag. In these regions it reaches approximately 110C. The project decided to have CTD test the CTD425/with 450 primer system to 115C to allow the full pulse and not worry about the torsional shear during ramp-down.	CLOSED

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201105-37	May 2011 CSU Peer Review	Peer-36	(Strykowsky, R) Incomplete passive plate analysis … should complete and reconcile whether to include in upgrade	Titus	Concur	Calculation NSTXU-CALC-12-01-01 is being worked on to address this.	CLOSED
201105-38	May 2011 CSU Peer Review	Peer-37	(Perry, E) Need to complete passive plate analysis and determine cost, schedule and operations impacts of any proposals. (affects bakeout, operations as well as outage duration and cost) Should be discussed with Menard.	Dudek	Concur	Passive plate analysis is complete. See calc number NSTX-CALC-12-01-01 Update of Analysis of Vacuum Vessel and Passive Plates.	CLOSED
201105-39	May 2011 CSU Peer Review	Peer-38	(Perry, E) Analysis indicates that the PF 4/5 supports are not stiff enough according to Titus summary slide.	Smith	Concur	Closed. This was a misunderstanding of Titus slides. Stiff support was included in design.	CLOSED
201105-40	May 2011 CSU Peer Review	Peer-39	(Perry, E) Items listed on "Needing Resolution" slide by Titus need to be fully resolved and all issues closed.	Heitzenroeder	Concur	Concur. These need to be completed by the Lehman review.	CLOSED
201105-41	May 2011 CSU Peer Review	Peer-40	(Daly, E - IO) Identify materials for T-slides on PF 4 supports and confirm that design can accommodate required travel, and make sure it doesn't lock up.	Smith	Concur	Closed. Interface material is magna plate. T-slide length of travel confirmed.	CLOSED
201105-42	May 2011 CSU Peer Review	Peer-41	(Kalish, M) Determine if an upgrade is required for the bakeout power supply to account for the change in resistance of the inconnel tube	Ramakrishnan	Concur. A new power supply is being ordered.		CLOSED
201105-43	May 2011 CSU Peer Review	Peer-42	(Kalish, M) Evaluate if additional cooling at ceramic break seal is desirable to allow for higher bakeout temperatures … may require additional helium tubing as well.	Dudek	See Peer-07 (201105-07)	See Peer-07 (201105-07) with same concern. Closed 5/25/11. This is being added to the design per discussion with Jim Chrzanowski on 5/20/2011.	CLOSED
201105-44	May 2011 CSU Peer Review	Peer-43	(Kalish, M) Look into past thermocouple failures that occurred during bakeout operations to determine if there are lessons learned to be applied.	Kaita	Concur	The bottom line is that it can be addressed with a simple modification to the installation procedure. Instead of pressing a "bare" TC bead into the tile hole, we first attach a small insulator with the same high-temperature cement we used to keep the TC's in place in the present tiles. The procedure change will be covered task is 4100-0045, and it's scheduled to start in June 6, 2012 and end on July 3, 2012. This is going to be primarily a modification of an existing installation procedure,	CLOSED
201105-45	May 2011 CSU Peer Review	Peer-44	(Viola, M) Assure assembly tolerances are adequate for friction and pinned connections and consistent with analysis assumptions.	Smith	Concur	Ongoing Validation documents will be signed calculations	CLOSED
201106-01a	June 2011 FDR	Chit-01	(Minervini, J) Aluminum block support of TF legs to umbrella structure. Consider thermal expansion mismatch and Eddy currents. Does this still work effectively with larger thermal and EM forces in upgrade configuration?	Titus		8/16/11 - Discussed with Peter Titus. The temperature delta of 0.2^{o}C was found to be insignificant. Follow up with Art Brooks who has done the calculation for verification.	CLOSED
201106-01b	June 2011 DCPS PDR	Chit-01	Develop strategy for relationship between PSRTC and DCPS considering two aspects: 1) Simulation of proposed shots for pre-shot planning, and 2) PSRTC features to be retained, added, or deleted.	Stevenson	Concur. Strategies need to be developed, and are expected to evolve as the DCPS design matures. Action R. Hatcher	Strategies presented at RTC CDR. See DCPS software reviews.	CLOSED
201106-02a	June 2011 FDR	Chit-02	(Minervini, J) Recommend building a mock-up fixture to simulate OH and TF inner leg interface to practice working with long length of Aquapour removal in relevant geometric configuration.	Chrzanowski	Concur	A mockup of the OH-TF diameter x 8' long will be fabricated to demonstrate the removal of the Aquapour	CLOSED
201106-02b	June 2011 DCPS PDR	Chit-02	Have PSRTC have a "with" or "without" DCPS mode.	Hatcher	Concur. Similar to Chit #1. Action: R. Hatcher to consider		CLOSED
201106-03a	June 2011 FDR	Chit-03	(Minervini, J) Recommend developing a controlled procedure and access for DCPS hardware and software changes.	Stevenson	Concur.	Procedure OP-DCPS-779 development in progress. OP-DCPS-779 will be developed cincurrent with dummy load testing and will be implemented for Operations.	CLOSED
201106-03b	June 2011 DCPS PDR	Chit-03	Develop strategy for relationship between water system PLC and DCPS. Determine which failure modes should be detected by each, and determine which water systems signals are needed for DCPS, striving to avoid introduction of a large number of analog I/O.	Hatcher	Concur. Action: R. Hatcher.	(11/29/12) This has been completed.	CLOSED

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201106-04a	June 2011 FDR	Chit-04	(Minervini, J) PF Bus leads appear to diverge. This separation increases the torques on the leads. Can we reduce this?	Smith		Closed. Bus lead spacing minimized.	CLOSED
201106-04b	June 2011 DCPS PDR	Chit-04	Develop several scenarios for the upgrade using upgrade geometry, currents, fields, etc for algorithm testing	Hatcher	Other. The committee agreed that this would be useful, but that it is out of scope for current DCPS requirements and design. Consider developing time-dependent scenarios. Action: R. Hatcher	Out of scope - Not required for the NSTXU project.	CLOSED
201106-05a	June 2011 FDR	Chit-05	(Minervini, J) Please put wrench flats on struts at the ends not middle. The flat at the middle degrades buckling.	Smith		Closed. Wrench flats relocated as recommended.	CLOSED
201106-05b	June 2011 DCPS PDR	Chit-05	Consider some peer reviews regarding software structure to bring in the C-language optimization considerations into the design.	Hatcher	Concur. Action: R. Woolley/R. Hatcher		CLOSED
201106-06a	June 2011 FDR	Chit-06	(Bialek, J) Dynamic loads should be calculated and dynamic analysis performed on a single 3-D model of the NSTX-U.	Titus		Calculation NSTXU-CALC-133-13-00 Rev 0 has been issued for final approval.	CLOSED
201106-06b	June 2011 DCPS PDR	Chit-06	When looking at the "time to next shot"delay, have option to use coil currents from previous shot to determine the envelope of coil currents (maybe with a 10% increment/)	Stevenson	Concur. Action: R. Hatcher	Out of scope. Evaluate for Ops. At present, I do not believe that there is any "time to next shot" capability in DCPS. While I think we will for sure want to optimize this parameter, the chit itself may be out of scope for the present implementation……I also point out that since the shot duration is controlled by the physics operator via PCS but the time between shots is regulated by the PDP timer, it can be a bit tricky to automate this or apply administrative controls. So this needs more thought. See below also.	CLOSED
201106-07a	June 2011 FDR	Chit-07	(Minervini, J) Almost all TF and PF coil loads are carried by the NSTX-U vacuum vessel. The vacuum vessel should be subjected to a buckling analysis using combined disruption and coil loadings.	Titus		A NSTX Vessel Buckling PowerPoint presentation was given on 9/21/11 at the Wednesday NSTX weekly meeting. This is the work that closes out the buckling chit.	CLOSED
201106-07b	June 2011 DCPS PDR	Chit-07	Fatigue calculations should be done elsewhere since they are not real-time	Hatcher	Action: R. Hatcher to make determination for the final design.		CLOSED
201106-08a	June 2011 FDR	Chit-08	(Minervini, J) Actual vessel measurements showing dominant deviations from design dimensions should be included in computer models used for mechanical analysis.	Titus		These measurements will be looked at in chit 07 from the June FDR (date ref - 201106-07).	CLOSED
201106-08b	June 2011 DCPS PDR	Chit-08	DCPS requirements document to be signed off prior to the FDR.	Hatcher	Concur. Action: R. Hatcher		CLOSED
201106-09a	June 2011 FDR	Chit-09	(Minervini, J) Consider reducing the GRD specified number of full power load cycles for the center column structures, i.e. TF inner legs/OH coil and possibly the center vacuum tube.	Neumeyer		The NSTXU Center Stack Upgrade GRD was upgraded in revision 4 (dated 9/15/11) which modified section 2.4.b and Table 2.4 to clarify interpretation of pulse spectrum and revise total number of pulses to more realistic number.	CLOSED
201106-10a	June 2011 FDR	Chit-10	(Minervini, J) Consider using engineering diagnostics (position monitors, strain gauges) to verify load paths and deflections are as expected.	Dudek	Concur.	A plan is being developed to provide position sensors around the machine to monitor deflections. This system has been used on the existing machine to baseline the ANSY analysis. For the upgrade a plan will developed to use the same transducers on the upgraded structures to monitor deflections and verify load paths. (planned closure September 2011). 8/18/11 - Everything is installed and ready to take data when the machine restarts.	CLOSED
201106-11a	June 2011 FDR	Chit-11	(Minervini, J) The CTD fatigue data on insulation shear strength was carried out at 10 Hz, but normal operations has a much slower rate (i.e. 2-5 seconds). Hence the fast fatigue data may be optimistic and not account for creep and fatigue correctly. Perform insulation tests at a reduced cyclic rate.	Chrzanowski		Refer to Date Ref 201006-13 for details on testing.	CLOSED
201106-12a	June 2011 FDR	Chit-12	(Minervini, J) Further analysis is needed to resolve stress analysis discrepancies (i.e. slow discharge disruption calculations which showed 10X difference	Titus		The referred to analysis will be done as part of Peer-36 from the May 2011 CSU Peer Review (Date Ref 201105-37).	CLOSED

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201106-13a	June 2011 FDR	Chit-13	(Minervini, J) If funding becomes available, please consider purchasing TF power cabling.	Strykowsky	Concur.	CS power cables (will be accelerated by 6 months (award early FY12) and NBI cable from Mar 2013 to Oct 2012. This would provide a net of 10 months and 8 months float respectively. This chit will be considered closed upon completion of the ETC and resultant re-scheduling exercise . (planned completion September 2011)	CLOSED
201106-14a	June 2011 FDR	Chit-14	(Scoville, T) Expecting all the old NB CAMA equipment to function properly after years of hibernation is not wise. Plans should incorporate some significant debugging and repair time to bring up the old equipment	Stevenson		Confirmed as closed via conversation with Tim Stevenson on 8/10/11.	CLOSED
201106-15a	June 2011 FDR	Chit-15	(Price, L) Revise the Project Execution Plan by September, 2011	Strykowsky	Concur.	The PEP is currently being revised and will be submitted to DOE-PSO for approval September 2011. It will also be presented and discussed at the October Lehman review. This chit will be considered closed upon issuance of the draft PEP to DOE-PSO. (planned completion September 2011)	CLOSED
201106-16a	June 2011 FDR	Chit-16	(Price, L) Establish an independent, external Project Advisory Committee by September, 2011	Strykowsky	Concur.	This has always been the intent but it will be defined in the updated PEP. This chit will be considered closed upon issuance of the draft PEP to DOE-PSO. (planned completion September 2011) 11/29/11 - This has been reopened as it is still being determined if establishing an independent Project Advisory Committee is the way to proceed. 2/14/12 - Currently the project is reviewed twice a year by both the PU advisory committee as well as by OFES-OPA. We are pondering the benefit of yet a third review panel for the class of project.	CLOSED
201109-01	September 2011 TF Bundle Failure Review	Chit-01	Consider ways to reduce amount of exposed solder: – A barrier (preferably metallic) between solder and insulation, e.g. special tube extrusion to fill groove, or saddle over tube, or brush plating over solder. – An extruded conductor that includes the water passage would be preferable, but PPPL found that this is not commercially available and has already purchased the turn material.	Chrzanowski		Presently we are hiring Solder consultant to advise on these matters	CLOSED
201109-02	September 2011 TF Bundle Failure Review	Chit-02	Develop acceptance and inspection (maintenance) criteria	Chrzanowski		Presently we are hiring Solder consultant to advise on these matters	CLOSED
201109-03	September 2011 TF Bundle Failure Review	Chit-03	Develop an automated process to control temperature during soldering, hand torch soldering not likely to work with rosin type flux	Chrzanowski		Presently we are hiring Solder consultant to advise on these matters	CLOSED
201109-04	September 2011 TF Bundle Failure Review	Chit-04	Provide turn to turn short detection system, built into power supply interlocks, to interrupt shot if current leakage is detected. A description of the MAST system is contained in Annex 3	Ramakrishnan	Adjusted completion date to 4/1/14 per R. Ramakrishnan. (B. Jedic)	Current action plan: 1) Implement a ECP to modify the scope 2) Determine the cost / manpower to design and install the turn to turn detection system 3) Segregate the costs as to what is critical to be done for the upgrade versus what can be installed after the upgrade 4) Prepare for a conceptual design review 10/28/14 - The chit is closed. The FDR is done. Installation is in progress (Raki)	CLOSED
201109-05	September 2011 TF Bundle Failure Review	Chit-05	Conduct a development program to establish soldering and cleaning processes that meet all requirements. This program can proceed in parallel with turn machining. - make sure solder bond is adequate - Consider alternate solder alloys, e.g. 5% silver-95% tin was used on MAST (Stay-Brite) - Perform necessary tests to ensure solder/cleaning processes are compatible with epoxy system	Chrzanowski		Presently we are hiring Solder consultant to advise on these matters	CLOSED
201109-06	September 2011 TF Bundle Failure Review	Chit-06	Provide a larger- scale verification test of CS section fabrication (all planned steps and materials) and testing (electrical, mechanical, metallurgical). This should be a quadrant- size cross section with limited length.	Chrzanowski		The first quadrant will be used for this purpose. Non-destructive testing will verify the integrity of quadrant. Contingency provides the funding for replacement in case of manufacturing failure.	CLOSED

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201110-01	October 2011 OPA EVMS Acceptance Review	CAR-1	Acceleration of schedule and added scope without formal baseline change; --The project should measure against a realistic baseline --Project is managing to an accelerated schedule not baseline --Follow formal change control processes and procedures --Document changes to performance baseline	Strykowsky	The NSTX-U project will submit an Engineering Change Proposal (ECP) to change the performance measurement baseline to reflect accelerated approval of selected tasks. The ECP is being drafted and expected to be submitted for review and approval by October 31, 2011.	Action Plan - 10/31/11: (1) Near term. The NSTX-U project will submit an Engineering Change Proposal (ECP) to change the performance measurement baseline to reflect the DOE-OFES approval to accelerate selected tasks. The ECP is being drafted and expected to be submitted for review and approval by November 11, 2011. The ECP will document OFES authorization to proceed with critical path/high value procurement and begin select outage removal tasks in advance of receiving CD-3 approval. (2) The entire PMB will be assessed in concert with DOE-PSO and DOE-OPA mid fiscal year once the following prerequisites are met: • CD-3 approval received (January 2012 target) • Fiscal 2011 funding received and reconciled with other NSTX Program (non-project) objectives • A reasonable and achievable accelerated plan is prepared that provides; o Adequate contingency set-aside o Detailed accelerated procurement planning including identification of risk and availability of procurement staff to support the plan. o Critical skills resource leveling. • The decision to change the PMB is approved by DOE-PSO and DOE-OPA.	CLOSED
201110-02	October 2011 OPA EVMS Acceptance Review	CAR-2	VARs must be written at the Control Account Level as a minimum	Strykowsky	When a variance threshold is triggered a variance analysis report will be written at the control account level. The PPPL Project Management System Description (PMSD), section 2.3.2 on Variance Analysis, will be updated to indicate that "when a variance threshold is triggered the variance analysis report must be written at the control account level".	Action Plan - 10/31/11: 1. Agreed. When a WBS Level II variance threshold is triggered a variance analysis report will be written at the control account level. Target: Complete 2. Agreed. The PPPL Project Management System Description (PMSD), section 2.3.2 on Variance Analysis, will be updated to indicate that "when a variance threshold is triggered the variance analysis report must be written at the control account level". Target: Complete 3. Agreed. The CAM training material will be prepared to demonstrate the proper method for preparing a variance analysis report. Target: Complete 4. Agreed. A PEP revision has been completed (needs approval-by end of February); however, the following thresholds are noted in the latest revision which is in the approval cycle: SV +15% or -10% or >$50K and > 10% of BAC or any impact on any DOE Level 1 or 2 Milestone CV +15% or -10% or > $50K. and > 10% of BAC	CLOSED
201110-03	October 2011 OPA EVMS Acceptance Review	CAR-3	Schedule logic and excessive constraints degrades the integrity of the schedule and critical path.	Strykowsky	The Primavera schedule data base is being reviewed and updated to improve the schedule logic to minimize hanging ends and reduce the number of constraints to only those necessary. The Primavera data base consistent with the ECP referenced above in CAR-01 will be reviewed and updated prior to October 31, 2011.	Agreed. Accuracy and completeness of the project's master schedule is necessary to ensure correct and timely information to all levels of the project team. The Project's Master Resource Loaded schedule is the key document used for performance measurement, milestones and lower level working schedules. This master schedule is statused each month during a group meeting consisting of the CAM, Project Manager, Project Controls, CSU and NBI Managers, and Associate Director for Engineering and Infrastructure. As well as reviewing each task for progress, the CAM and Project Controls manager validate the logical sequences of tasks and add additional links if warranted. Furthermore, criticality of each task is noted by reviewing the total float value remaining on each task. To ensure work is prioritized properly, logically linked and consistent with budgetary guidance the project control office performs QC checks to ensure all ECP's are properly included, and that there are no unexplained hanging ends, unnecessary constraints or tasks without predecessors. (See cell comment for remainder of explanation)	CLOSED

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201110-04	October 2011 OPA EVMS Acceptance Review	CAR-4	Inconsistent identification and application of LOE vs. Discrete across Control Accounts	Strykowsky	Each of the work packages that are identified in the PMB will be reviewed to determine if LOE scope is inadvertently included in a work package that is identified as using discrete effort for EV technique. If instances are found where LOE and discrete scope is included in a work package an ECP will be generated to separate the LOE work from the discrete work so that the EV technique applied to the work package is appropriate. As a best practice the amount of LOE work included in a control account that is dominated by work packages that use discrete effort for EV technique is kept to a minimum (<15%) so as not to mask variances.	Upon closer review it is obvious that in several NSTX-U Control Account there was no time budgeted for EVMS/PM related Level of Effort (LOE) activities. On future DOE 413.3B projects this will be consistently incorporated in ALL Control Accounts during the planning phase. For the NSTX Upgrade Project the Control Accounts that have not included LOE time for this type of activity will incur a cost variance as a result of time spent on this type of activities. No further action should be required for this CAR.	CLOSED
201110-05	October 2011 OPA EVMS Acceptance Review	CIO-1	Recommend improvement in CAM ownership of EAC development, tracking and active revision	Langish	Ownership will be improved by REQUIRING CAMs to provide a monthly update of the EAC and their explanation of how/why it changed. This can be accomplished via the monthly statusing process where the CAMs will be required to supply a value for their EAC each month.	This will be implemented in the Status process for the month of October. (12/13/11) This has been implemented; however, the effectiveness of the implementation is still on-going. The CAM refresher training will address this specifically for reinforcement.	CLOSED
201110-06	October 2011 OPA EVMS Acceptance Review	CIO-2	Recommend validation of actual costs from COBRA by CFO	Langish	Tony Bleach to "approve" monthly actuals with digital signature.	Discussions have begun with Tony Bleach to refine the process. Currently using September close as a way of refining. (10/21/11) Division Head of PPPL accounting to "approve" monthly actuals with digital signature. The Head of Accounting reports directly to the laboratory CFO.	CLOSED
201110-07	October 2011 OPA EVMS Acceptance Review	CIO-3	Recommend additional EV training, some examples include: a) PPPL change control processes, procedures, and responsibilities (when and how) b) EAC c) Understanding of Control Account Plans	Langish	Additional training will be conducted to specifically focus on 1) change control processes/procedues/responsibilities 2) estimate at complete (EAC) 3) control account plans	Training material has been updated; however, the training has not yet been scheduled. Will be performed in early January.	CLOSED
201110-08	October 2011 OPA EVMS Acceptance Review	CIO-4	Recommend documentation clarifications and corrections, some examples include: a) Formally document management decisions b) Include UB and clarify MR in System Description c) Clarify matrix relationship between Engineering and Infrastructure and CFO in System Description	Langish	a) Create a section in the on-line CAM Notebook where management decisions can be formalized/posted. b) PMSD will be updated to Include UB and clarify MR in System Description c) PMSD will be updated to clarify matrix relationship between Engineering and Infrastructure and CFO in System Description	First draft to be completed by 21 Oct 2011. Revision 2 to be completed by 30 Nov 2011. (12/13/11) a) Completed b) c) First draft is completed. Hope is to have issued by end of December.	CLOSED
201110-09	October 2011 OPA EVMS Acceptance Review	CIO-5	Recommend including documentation of EV technique (% Complete) in each Work Authorization Form.	Langish	Action will be taken to include the EVT on the Work Approval Form (WAF). To include methodology for taking % complete.	The on-line WAF has been updated to include the Earned Value Technique (EVT) used. The form HAS been posted on the Project Management web page. The CAMs on the NSTX-U project are aware that they are to have a methodology for how they are taking progress on % complete tasks and that documenting the approach is ideal; however, the project is not currently requiring that CAMs provide documentation for their approach. No further action should be required for this CIO.	CLOSED
201110-10	October 2011 OPA EVMS Acceptance Review	CIO-6	Recommend continued improvement to Change Control Procedures and Processes, some examples include: a) Consistent mechanism needed to process administrative changes b) Time phasing was changed in June 2011 but not reflected in CPR Format 3 c) PEP requires log of approved/disapproved/pending changes and ensure continuous maintenance.	Langish	Recommend continued improvement to Change Control Procedures and Processes, some examples include: a) Consistent mechanism needed to process administrative changes b) Review committee did not review May CPR3 which would have show the change from May to June. June-July-Aug same! c) This was performed during the certification review		CLOSED
201110-11	October 2011 OPA EVMS Acceptance Review	CIO-7	PEP and RAM have one control account listed against 4 WBS elements.	Langish	The Project Execution Plan Work Breakdown Structure (WBS) Dictionary and the Responsibility Assignment Matrix (RAM) were both updated during the Certification Review to correct this issue. No Control Accounts are associated with more than one WBS element.	The CAMs on the NSTX-U project are aware that they are to have a methodology for how they are taking progress on % complete tasks and that documenting the approach is ideal; however, the project is not currently requiring that CAMs provide documentation for their approach. No further action should be required for this CIO.	CLOSED

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201110-L01	October 2011 Lehman Review	2.1	Develop a plan for a set of diagnostics for measuring halo currents and vessel displacement to accommodate future installation by the DCPS final design review.	Dudek	The diagnostics plan for the measurement of the halo currents has been adopted and added as a new workscope under 9417 **** 4100 for the mechanical portion and a future operations job for the electronics. The cost for vessel and joint monitoring was estimated (see attached) and was judged unnecessary at this time. Provision was added to the TF flex connector for resistance sensor should measurement be required at some future time.		CLOSED
201110-L02	October 2011 Lehman Review	2.2	Evaluate procuring spare key fabrication tooling (e.g. induction heater) to reduce schedule risk from failures prior to start of fabrication.	Chrzanowski			CLOSED
201110-L03	October 2011 Lehman Review	3.1	Develop a complete Hazard Analysis Report for the Project as required for CD-3.	Levine	Concur.	Complete	CLOSED
201110-L04	October 2011 Lehman Review	3.2	Develop Construction Project Safety and Health Plan as required for CD-3.	Perry	Concur	In preparation.	CLOSED
201110-L05	October 2011 Lehman Review	3.3	Clearly document the Operational Readiness Review process for the project including both PPPL and DOE requirements within the HAR.	Levine	Concur.	Complete	CLOSED
201110-L06	October 2011 Lehman Review	4.1	Better quantify risks associated with the acceleration approach by February 2012.	Strykowsky	Concur.	Project is being monitered via a procurement log and via weekly scheduling reviews.	CLOSED
201110-L07	October 2011 Lehman Review	4.2	The project and the program need to start communication process for contingency usage proposals (wish list).	Strykowsky	Concur. The project will continue to present cost opportunities to the NSTX Program manager for additional scope considerations.		CLOSED
201110-L08	October 2011 Lehman Review	5.1	Proceed aggressively with the advanced early finish schedule.	Strykowsky	Concur. Outage tasks are underway .		CLOSED
201110-L09	October 2011 Lehman Review	5.2	Quantify and address procurement risks to the accelerated early completion schedule as soon as possible.	Strykowsky	Concur. A Project procurement list have been prepared and will be discussed with the procurement office as to additional staffing needs and/or additional purchasing vehicles for fabrication of parts and hardware.	Procurement tracking log in place. Focus on procurement tasks monitored weekly at rollover meetings.	CLOSED
201110-L10	October 2011 Lehman Review	5.3	Request CD-3 approval after recommendations are completed.	Strykowsky	Yes. Items 201110-L03, 04, and 05 are necessary and will be completed by 11/11/2011. The project will transmit a formal request and readiness assessment to DOE-PSO.		CLOSED
201112-01	December 2011 MPTS FDR Review	Chit-01	(Perry, E) North South run of output flight tube should hug existing handrail of EL 119'6" platform (to maximize real estate on two new sections of 119'6" platform against West side of NSTX	Labik	Concur	11/11/12 - Discussion with G. Labik indicated this work has not yet been finalized. This chit will be reopened until completed with a 4/30/13 completion date. Agreed and being incorporated into the design of the laser dump vacuum boundary. After additional review the dump flight tube will turn due North at the upper platform and thus away from real estate needed for added crane access.	CLOSED
201112-02	December 2011 MPTS FDR Review	Chit-02	(Stevenson, T)As part of ex-vessel work, consider combining support structure for dump flight tube with the NBI duct support structure if electrical breaks allow.	Labik	Concur	The structural support for the MPTSU dump tube and other vacuum components is integrated into the NB2 support structure of the vacuum pump transition duct with 1/2 inch thick G10 stand off for 5 KV.	CLOSED
201112-03	December 2011 MPTS FDR Review	Chit-03	(Dudek, L) Labik should provide a replacement PF support column @ F with provision to clear the flight tube. (Suggest a column with picture frame around flight tube .)	Smith	Concur	The column modification is being worked out in conjunction with Mark Smith. The location, material selection and crosss section are to be selected to reduce the footprint since the MPTS laser flight tube and calibration probe centerlines cannot be changed . The final solution and location will be a field installation decision. Reassigned to Mark Smith. Mark will evaluate required spacing using the latest model.	CLOSED

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201112-04	December 2011 MPTS FDR Review	Chit-04	(LeBlanc, B) Modification of the PF coil strut should be compatible with installation of mechanized in-situ probe.	Smith	Concur	This requirement is incorporated into the present design of the column. See chit #3. The layout indicates reasonable space for the column. Reassigned to Mark Smith. Mark will evaluate required spacing using the latest model.	CLOSED
201112-05	December 2011 MPTS FDR Review	Chit-05	(LeBlanc, B) Provide enough vertical gap above the laser flight tube to permit implementation of the thermionix -LITER type - mechanized probe.	Labik	Concur	Agreed 7.5 inches provided. See drawing E9D11177	CLOSED
201112-06	December 2011 MPTS FDR Review	Chit-06	(LeBlanc, B) Plasma is likely to interact with the reinforcement bars (Bay L) and generate metallic impurities. Suggest covering bar with Moly or Boron Nitride.	Labik	Concur. Will consider provision of accommodations to be determined at ex-vessel or later reviews.	The loads from a thin wall moly sheet were calculated by EA. The solution is to provide a thin moly coating over the SS bars . In addition a series of 5/16-18 blind holes are provided. See drawing EDB1442	CLOSED
201112-07	December 2011 MPTS FDR Review	Chit-07	(Raftopoulos, S) Create layout to account for the MSE-LIF optics which are up against the laser tubes next to TF #7.	Labik	Concur	A simplified study of the 3D space was made and a field examinatioin was made with Fred Levinton . Fred's conclusion was that sufficient space was available to route the MSE-LIF fibers from Bay G to the East -West cable tray that supports the fibers.	CLOSED
201112-08	December 2011 MPTS FDR Review	Chit-08	(Roquemore, L) The Bay L port cover has a 6" port at the 6 o'clock position. This is to accommodate a fusion products probe. It would be optimal for the measurement if the ports was closer to the 12 o'clock position. Please consider this arrangement.	Labik	Concur	This change has been incorporated into the Bay L cap design. The IR cameras have been moved below midplane.	CLOSED
201205-01	May 2012 Lehman Review	2-01	(Kellerman, A) Review and update the risk registry to more completely reflect items (mentioned in comments) that are on the critical path or near-critical paths.	Strykowsky	Concur. The project will perform a management review and re-assement of the risk registry.		CLOSED
201205-02	May 2012 Lehman Review	3-01	(Won, R) Review the risk registry/assessment and scope contingency plan to ensure they are complete and up to date.	Strykowsky	Concur. The project will perform a management review and re-assement of the risk registry.		CLOSED
201205-03	May 2012 Lehman Review	4-01	(Crescenzo, F) Program, Project, Laboratory and Site Office develop a strategy to address impacts from potential changes in the funding profile.	Strykowsky			CLOSED
201205-01	May 2012 Ex Vessel MPTS PDR	Chit-01	(LeBlanc, B) Investigate implication of long tube repair on NSTX operation. Speak to Bill Blanchard. Consider extra TIV.	Labik	Concur	Reviewed with W. Blanchard. Baking to 150 ºC and a single 1.5 inch tube and pump cart sufficient to pump the tube volume. A gate valve is provided to protect the window from debris during the 150^{0}C bake.	CLOSED
201205-02	May 2012 Ex Vessel MPTS PDR	Chit-02	(LeBlanc, B) Provide enough room for the fiber optics at "knee" of illumination probe.	Labik	Concur	There is room for approximately a 5 inch bend radius which is sufficient for a stranded FO cable	CLOSED
201205-03	May 2012 Ex Vessel MPTS PDR	Chit-03	(Diallo, A) Consider comparing old configurations and new parallel plate configurations of the baem dump. Compute the number of bounces vs. fewer bounces. Check relative improvement.	Labik	Concur	The in vacuum laser dump design will not be used. The existing in air dump will be used requiring a vacuum window.	CLOSED
201205-04	May 2012 Ex Vessel MPTS PDR	Chit-04	(Gerhardt, S) Consider an interlock on the probe position to be sure we don't make a plasma w/ probe inserted.	Labik	Concur	The interlock will be added to the electrical portion of the design. Suggest two limit switches. (6/10/13) G Labik explained that the interlocks will currently not be installed until approximately 1 year after startup as it stands now. (11/4/14) G Labik that the needed probe is still being designed. Should be considered under operations. No CD-4 impact. Alignment probe probably won't even be there for CD-4.	CLOSED
201205-05	May 2012 Ex Vessel MPTS PDR	Chit-05	(Gerhardt, S) Schedule, access, arrangement aspects of the interfacing to the rest of the NSTX-U project needs to be addressed.	Labik	Concur	Agreed . Underway but not completed yet. A partial set of future dates will be presented at the 19 Nov 2012 MPTSU Laser Input FDR. (G. Labik) This is now include in the rollover schedule.	CLOSED
201205-06	May 2012 Ex Vessel MPTS PDR	Chit-06	(Gerhardt, S) Should check if the beam dump can indeed be located at the present location of the 1st bending mirror.	Labik	Concur	To be addressed at the Laser Dump FDR. (6/10/13) - still in progress This was from when there was risk that the exit side might not get finished. We are now far beyond the stage where this chit would be useful. Hence, the chis is obsolete/resolved.	CLOSED

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Date Ref	Review	Item	Concern/Recommendation	Responsibility / WBS or Job	Comment/Action	Current Status	Status
201205-07	May 2012 Ex Vessel MPTS PDR	Chit-07	(Gerhardt, S) Graphite in the dump will be an eternal source of H2O. Can it be replaced with something metallic?	Labik	Concur	See the response to chit #3 (Date Ref 201205-03)	CLOSED
201205-08	May 2012 Ex Vessel MPTS PDR	Chit-08	(Stratton, B) Need to clearly define and review the strategy for baking the long beamline leading to the beam dump.	Labik	Concur	See the response to chit #1 (Date Ref 201205-01)	CLOSED
201311-01	November 2013 Coil Bus FDR	Chit-01	(Titus, P.) The series connection between PF4&5 upper and lower runs inside of the TF cage and must be qualified.	Afnafu	Concur. Evaluate these existing connections. (perhaps Title III)		CLOSED
201311-02	November 2013 Coil Bus FDR	Chit-02	(Khodak A.) The effect of the new smaller TF bus bar support needs to be analyzed.	Afnafu	Concur. Evaluate.		CLOSED
201311-03	November 2013 Coil Bus FDR	Chit-03	(Dudek, L.) Where clamps are bolted to the floor consider field conditions i.e. rebar in the floor, adjacent ground bus, etc. Suggest making the weld bewteen pipe and floor plates a field joint to allow last minte adjustments.	Afnafu	Concur. Field tack and weld.		CLOSED
201311-04	November 2013 Coil Bus FDR	Chit-04	(Ramakrishnan R.) During bakeout jumber are required to be provided at the top of the machine. Does the desgin include these jumpers?	Chrzanowski	Out of scope for this FDR but correct. Already included in another job.	The flags are completed. Still need to complete the assembly drawing.	CLOSED
201311-05	November 2013 Coil Bus FDR	Chit-05	(Ramakrishnan R.) Calculate the lead resistances and check during PTP.	Afnafu	Concur. Will provide R and include measurement in PTP.		CLOSED
201311-06	November 2013 Coil Bus FDR	Chit-06	(Ramakrishnan R.) Water cooling to CHI ring bus will be necessary only during bakeout?	Afnafu	Probably correct statement. However, undue effort in unhooking it and drying it may make it easier to leave it installed. Operations decision.	It was determined that the no further work is needed on this Chit.	CLOSED
201308-01	August 2013 DCPS Software FDR	Chit-01	(Gerhardt. S.) A code review process should be defined in addition to the testing by running scenarios.	Stevenson	Concur.	A Code Peer Review occurred in July 2014.	CLOSED
201308-02	August 2013 DCPS Software FDR	Chit-02	(Gerhardt. S.) If regression testing is the proper means of tracking and fixing bugs, then it should be included in the pre-CD4 scope including the 96 design point scenarios.	Stevenson	Concur. Plans include providing infrastructure to accumulateand use tests as bugs are discovered.	In Progress. The auto-tested input file that toggles all the various coil current combinations is an easy way to probe the various points in parameter space.	CLOSED
201308-03	August 2013 DCPS Software FDR	Chit-03	(Strykowsky, R.) Recommendation: Suggest a generic policy/procedure for an independent review of all software code written for systems where consequences of failure are higher. Are we depending to much on software validation and not on the verification of the code?	Stevenson	Concur. Action: T. Stevenson to TCR ENG-033.	Design review policy = P-010. Design verificationprocedure = ENG-033. Recommend adding a peer review process for software to both.	CLOSED
201308-04	August 2013 DCPS Software FDR	Chit-04	(Henderson, P.) Use resources from Princeton University computer science in code reviews (ed note: or other outside reviewers TNS)	Stevenson	Concur. Will investigate.	Investigated but real time design resource not found. A Peer Review is planned on or about 7/1/14 to review code.	CLOSED
201308-05	August 2013 DCPS Software FDR	Chit-05	(Henderson, P.) Any change to upper and lower limit threshold files should be logged and differences between files subject to a review and approval process before being introduced ito the production environment.	Stevenson	Concur. Conduct of ops will require procedures to this effect which are planned for system use.	Regression testing, pre-operational testing, explicit test input files, integrated system testing, and operations procedures will be employed using OP-DCPS-779 and PTP. There are a number of "conduct of ops" chits. I think that modifications to the PDP timer should also be considered in this set of procedues. Ron Hatcher had discussed changing the between shot period fairly often (daily?) to accommodate different pulse types. In the end, I kinda think that the PDP timer will have to be made much smarter.	CLOSED
201308-06	August 2013 DCPS Software FDR	Chit-06	(Langish, S) Current activity 5200-2380 has 47k M&S budgeted for computer. Need ECP for additional funding for the computers and hardware described.	Stevenson	Concur. Check and resolve.	Resolved by Project Office and program.	CLOSED
201308-07	August 2013 DCPS Software FDR	Chit-07	(Ramakrishnan, R) Does the DCPS system meet the reliability criteria set forth in the DCPS requirements document? If so has it been documented?	Stevenson	Include in DCPS system review and FMEA.	FMEA revised for DCPS. Reliability document in progress.	CLOSED
201308-08	August 2013 DCPS Software FDR	Chit-08	(Ramakrishnan, R) In order to perform the FCPC testing acitvities the DCPS is requred to be functional by March 1, 2014 to support the project schedle3 for first plasma by mid September 2014.	Stevenson	Include in DCPS system review - resolve startup timing and coordiantion w/ FCPC testing. Explore opportunities to test DCPS in parallel with FCPC testing. DCPS required for ISTP.	Current schedule = 12/1/14 start of testing OK.	CLOSED

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201308-09	August 2013 DCPS Software FDR	Chit-09	(Ramakrishnan, R) It was stated that temperature calculated based on I2t. Since the resistance continuously changes is this not taken into consideration?	Stevenson	Concur - Evaluate and include in DCPS system requirements and algorithms if needed.	Consider for Ops and in light of Aquapour. The present specification from Ron and Charlie has only a simple I^2t calculation ("Action"). This can be made conservative by placing a limit on these values based on the resistance of hat copper. The present dcps_param tree only has the limits from the design point spreadsheet. Note that if the algorithm is to be expanded, then somebody from analysis devision need to specify how the temperature of various coils depends on the deposited energy, and the formula for the resistance as a function of temperature. And I think the limits will need to be expressed in terms of Joules, not kA^2s as at present.	CLOSED
201405-01	May 2014 DCPS AutoTester Interface Chassis Peer Review	Chit-01	(Gerhardt. S.) Consider purchasing parts so that the FCC AT setup need NOT be taken apart to do assembly.	Stevenson	Concur	Complete	CLOSED
201405-02	May 2014 DCPS AutoTester Interface Chassis Peer Review	Chit-02	(Gerhardt. S.) Purchase spare cables so that if they break when being moved it has minimal schedule impact.	Stevenson	Concur	Complete	CLOSED
201405-03	May 2014 DCPS RCIM Interface Chassis FDR	Chit-01	(Erickson, K.) Connectors to RCIM remove RCIM sync pins which are intended to synchronize the real DCPS to the backup as well as to the PCS computer also running DCPS. Document unconnected pins.	Stevenson	Concur – evaluate 2x25 pin vs. 60 pin and changes versus the timing and schedule impact of making the change.	In progress	CLOSED
201405-04	May 2014 DCPS RCIM Interface Chassis FDR	Chit-02	(Erickson, K.) What mechanism will be used to control & manage the RIC source code? DCPS requires controlled software as part of overall security and safety. Recommend using existing subversion repository or equivalent. Net backup is not adequate.	Stevenson	Concur – while this chit is not entirely in scope, will evaluate code control, version control, and the use of SCNs per procedure ENG-010	Per ENG policy the System Engineer (J. E. Lawson) will collect and maintain the appropriate software elements. This will be ongoing for Ops.	CLOSED
201405-05	May 2014 DCPS RCIM Interface Chassis FDR	Chit-03	(Gerhardt. S.) Consider including the basic capability of the RCIM interface chassis into the AT interface system.	Stevenson	Concur – evaluate and include if feasible.	In progress	CLOSED
201407-01	July 2014 DCPS Code Peer Review	Chit-01	(Sichta P.) Consider spare parts such as AI and motherboard. Software is dependent on specific hardware.	Stevenson	Concur. Consider for Operations.		CLOSED
201407-02	July 2014 DCPS Code Peer Review	Chit-02	(Sichta P.) DCPS_Param security features should be completed and read-only demonstrated in the test procedure.	Stevenson	Concur. Evaluate and test. Perhaps separate test prior to PTP.		CLOSED
201407-03	July 2014 DCPS Code Peer Review	Chit-03	(Sichta P.) Store DCPS version [from Sun?] with each shot (in the tree)	Stevenson	Concur. Add node.		CLOSED
201407-04	July 2014 DCPS Code Peer Review	Chit-04	(Tchilinguirian G.) Check for a negative event timeout value enterd by user.	Stevenson	Concur. Add.	Reassigned to K. Erickson who is doing the work.	CLOSED
201407-05	July 2014 DCPS Code Peer Review	Chit-05	(Stevenson T.) Evaluate and log all FIXME comments in the code prior to operations.	Stevenson	Concur. In progress.	DCPS has been PTPs. Any FIXME statement are operations scope.	CLOSED
201407-06	July 2014 DCPS Code Peer Review	Chit-06	(Lawson J.) Check Transrex Fault Detector zero current value and set to value lower than DCPS limit check.	Stevenson	Concur. Action J. E. Lawson.		CLOSED
201407-07	July 2014 DCPS Code Peer Review	Chit-07	(Davis B.) Keith has explained many good reasons varuous blocks of code were written. Someday, these explanation should go into the code.	Stevenson	Concur. Add comments. In progress…	Operations scope.	CLOSED
201407-08	July 2014 DCPS Code Peer Review	Chit-08	(Lawson J.) Add notes to InputData about program criticality. Add timing tests.	Stevenson	Concur.	Comment for DCPS code to be added Operations scope	CLOSED
201407-09	July 2014 DCPS Code Peer Review	Chit-09	(Massry A.) Install NetBackup.	Stevenson	Concur.		CLOSED

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201210-01	Oct 2012 PFC-1 Protective Tiles PDR	Chit-01	(Titus P.) Do at transient heat conductor analysis - or look at Art's to find out in the thermocouple can see the effect of the surface heat load fast enough to protect the PF1C mandrel.	Titus	Concur. Analysis was performed by Art and found that the thermocouple CAN provide feedback about the PF1C casing temp. However, the thermal response of this relationship is ~1-2 seconds and due to this and the probable fatigue failure of the weld at low temps (~200C), they should not be used as a primary diagnostic control.		CLOSED
201210-02	Oct 2012 PFC-1 Protective Tiles PDR	Chit-02	(Dudek L.) Determine by an analysis of TC can protect the PF1C (Time constant)	Titus	See chit 1		CLOSED
201210-03	Oct 2012 PFC-1 Protective Tiles PDR	Chit-03	(Gerhardt S.) Examine view from CHI branch 5 port of the PF1C canister. Can a bolometer or pyrometer measure temperature.	Gerhardt	View of the casing was confirmed. Can view the side of the casing but in order to view the corner which is at risk from heat flux, would have to cut new holes at an angle. Due to the sensitive nature of the PF1C, it has been accepted that the use of an upper and lower pyrometer is necessary and will be rolled into a work package for implementation.		CLOSED
201210-04	Oct 2012 PFC-1 Protective Tiles PDR	Chit-04	(Mueller D.) Provide estimate of surface melting due to CHI injector current impinging on stainless surfaces in gap.	Raman	Roger provided evidence that in normal operations, there is negligible change in temperature from CHI injector.		CLOSED
201210-05	Oct 2012 PFC-1 Protective Tiles PDR	Chit-05	(Gerhardt S.) Please include plans for 2 upper and 2 lower divertor gas injection ports. Details of design from Bill Blanchard, Lane Roquemore, Vlad	Tresemer	Concur. Modification to OBD tile design is minimal and can be done as a field-fit task.	(7/24/14) Kelsey to update drawings with note indicating the tiles will be fitted in place and update the installation procedure D-NSTX-IP-3360 to reflect this.	CLOSED
201210-06	Oct 2012 PFC-1 Protective Tiles PDR	Chit-06	(Menard J.) Make inboard tiles a bit too long and then shave them down to get the correct gap to the PF1C.	Tresemer	Concur. Done.	(7/24/14) Kelsey to update drawings with note indicating the tiles will be fitted in place and update the installation procedure D-NSTX-IP-3360 to reflect this.	CLOSED
201210-07	Oct 2012 PFC-1 Protective Tiles PDR	Chit-07	(Gerhardt S.) Need and alarm, software-likely, to inform COE and PIC that TC is reading too high.	Gerhardt	Concur, with modifications. It has been shown that feedback from the TCs is not sufficient. The pyrometers will be configured in such a way to protect the vacuum vessel from venting due to overheating of the PF1C casing. Execution plan still pending diagnostic Peer Review.	No risk of damage during CD-4. Should be handled under operations once we are running.	CLOSED
201210-08	Oct 2012 PFC-1 Protective Tiles PDR	Chit-08	(Raman R.) A) Look at gap between casing and outer wall after a layer of moly is installed (Need a CAD drawing). B) Consider adding a port and actively monitoring using a fast pyrometer (To look at the edge {of casing}).	Gerhardt	Concur. A) will be handled by Tresemer while B) shall be looked at by Gerhardt and Titus. Results of findings shall be presented at a future diagnostic peer review (TBD)	(11/4/14) - K Tresemer reviewed item "A" and deemed it not feasible. A) is obsolete since the moly sheet was not installed. B) is something we may revisit in a future opening	CLOSED
201210-09	Oct 2012 PFC-1 Protective Tiles PDR	Chit-09	(Dudek L.) Jim C. needs to change weld detail on corner of PF1C to provide .13" weld (vs. current 0.053")	Chrzanowski	Concur and is being implemented.		CLOSED
201406-01	Jun 2014 NSTX-U DCPS Hardware Interconnect FDR	Chit-01	(Gerhardt S.) The "Real World Loop" and "Autotester Loop" signals (digital and analog) should not be provided by the autotester. They should be internally determined by the Harwired User Interface in all conditions.	Schneider	Concur. Action: H. Schneider		CLOSED
201406-02	Jun 2014 NSTX-U DCPS Hardware Interconnect FDR	Chit-02	(Erikson K.) Consider ordering the Analog Card 2 Channels such that all 4 PDP signals are together. It Behooves us to keep things organized before it is built, and we can diverge in the future. Note that the Autotester & DCPS changes to support a reorder are very minimal.	Schneider	Concur with the value of organizing signals, but are concerned that reorganization at this time could result in significant drawing changes.	H. Schneider to consider and respond. This was considered. Not needed to change the DCPS at this time.	CLOSED
201406-03	Jun 2014 NSTX-U DCPS Hardware Interconnect FDR	Chit-03	(Ramakrishnan S.) In addition to Administrative Controls such as T-Mods, a positive way to insure that the coils are not fed -such as venting the SLD - before bypassing Level 1 Faults	Schneider	Concur. Procedurally, require that the SLD is vented when Level 1 Faults are bypassed. Action: T. Stevenson	The concern is covered in PTP-DCPS-1904.	CLOSED
201406-04	Jun 2014 NSTX-U DCPS Hardware Interconnect FDR	Chit-04	(Ramakrishnan S.) The Water System directly removes the permissive to the rectifiers. It is not appropriate to generate a Level 1 fault via the Water System PLC.	Schneider	System response to water system trips needs to be further reviewed.	No action required at this time (The system as presented is overly conservative).	CLOSED
201406-05	Jun 2014 NSTX-U DCPS Hardware Interconnect FDR	Chit-05	(Ramakrishnan S.) PDP input is really not needed to DCPS since the PDP directly removes the permissive from the rectiifiers.	Schneider	System response to PDP trips needs to be further reviewed.	No action required at this time (The system as presented is overly conservative).	CLOSED

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201406-06	Jun 2014 NSTX-U DCPS Hardware Interconnect FDR	Chit-06	(Ramakrishnan S.) Consider failure mode and remediation of loss of a feedback signal (faulty LEMO connection)	Schneider	The current DCPS relies on software to verify that feedback signals are in an acceptable range. Harware interlocking of feedback signals would have to be addressed in a re-design of the Halmar Signal Conditioner (HSC) System. (Out of scope for this review)	No action required at this time	CLOSED
201406-07	Jun 2014 NSTX-U DCPS Hardware Interconnect FDR	Chit-07	(Ramakrishnan S.) Consider providing a UPS power feed for the DCPS. Alternatively, use the 125 VDC battery system feed.	Schneider	Out of scope for this review. Future consideration.	No action required at this time	CLOSED
201411-01	Nov 2014 NSTXU OH Water Heater Peer Review	Peer-01	(Titus P.) Flow switch in low flow bypass exit RTD's should be close to the OH coil outlet - can be above umbrella otherwise communicate I^2T. try for better than 500 PSI heater	Atnafu	Concur		CLOSED
201411-02	Nov 2014 NSTXU OH Water Heater Peer Review	Peer-02	(Kalish M.) Re-examine logic for flow switches to determine if it's defeated with bypass logic	Atnafu	Concur	Work ongoing OH PREHEATER NOT REQUIRED FOR CD4 OR FIRST YEAR OPS.	CLOSED
201411-03	Nov 2014 NSTXU OH Water Heater Peer Review	Peer-03	(Dudek L.) How does the heater detect hairpin heater burns out? (Ask heater company)	Atnafu	Concur		CLOSED
201411-04	Nov 2014 NSTXU OH Water Heater Peer Review	Peer-04	(Dudek L.) See if I^2T signal can be used for temperature measurement.	Atnafu	Refer to Date Ref 201411-01		CLOSED
201411-05	Nov 2014 NSTXU OH Water Heater Peer Review	Peer-05	(Herzkowitz B.) Bypass control button to random test of flow switches between shots	Atnafu	Concur, implement if possilbe	Work ongoing. Refer to Date Ref 201411-02 OH PREHEATER NOT REQUIRED FOR CD4 OR FIRST YEAR OPS.	CLOSED
201411-06	Nov 2014 NSTXU OH Water Heater Peer Review	Peer-06	(Dudek L.) Need to verify voltage standoff for DI water @110 C (5 meters?)	Heitzenroeder	Concur, Phil Heitzenroeder to supply to Atnafu		CLOSED
201411-07	Nov 2014 NSTXU OH Water Heater Peer Review	Peer-07	(Gerherdt S.) Need to ensure that there can't be access to hot parts during test cell free access.	Atnafu	Concur, Heated piping and heater needs to be insulated both for safety reasons and to eliminate heat loss.		CLOSED
201411-08	Nov 2014 NSTXU OH Water Heater Peer Review	Peer-08	(Dudek L.) Make sure system has pressure relief.	Atnafu	Concur		CLOSED
201411-09	Nov 2014 NSTXU OH Water Heater Peer Review	Peer-09	(Dudek L.) For final design need FMEA revised to show failure nodes of modified system.	Atnafu	Concur		CLOSED
201411-10	Nov 2014 NSTXU OH Water Heater Peer Review	Peer-10	(Dudek L.) Consider using 1/2" non-conductive hose near machine (15ft.) and 1/4" conducting hose for remaining hose)	Atnafu	Concur		CLOSED
201411-11	Nov 2014 NSTXU OH Water Heater Peer Review	Peer-11	(Dudek L.) Use minimum flow (10%) bypass around 3 way bypass valve to allow RTD to see coil temperature.	Atnafu	Concur, Only required if I^2T is not used to set temperature		CLOSED
201411-12	Nov 2014 NSTXU OH Water Heater Peer Review	Peer-12	(Dudek L.) Need to address flow switches during bypass & switches, because this may trip system off.	Atnafu	**Refer to Date Ref 201411-02**	OH PREHEATER NOT REQUIRED FOR CD4 OR FIRST YEAR OPS.	CLOSED
201411-13	Nov 2014 NSTXU OH Water Heater Peer Review	Peer-13	(Dudek L.) Provide flow switch in bypass to deflect flow. (Failure mode if bypass flow is blocked and RTD's can't read temperature)	Atnafu	Concur	OH PREHEATER NOT REQUIRED FOR CD4 OR FIRST YEAR OPS.	CLOSED
201411-14	Nov 2014 NSTXU OH Water Heater Peer Review	Peer-14	(Dudek L.) Consider procuring spare (parts) hairpin heaters for heater.	Atnafu	Concur		CLOSED
201304-01	Apr 2013 CS Gas Injection System Peer Review	Peer-01	(Mueller D.) The plenum is a small volume (I will specify exactly after the review). So there can be no larger volume in the line for vacuum connection.	Mueller	Concur		CLOSED
201304-02	Apr 2013 CS Gas Injection System Peer Review	Peer-02	(Mueller D.) Use two sizes of tube. 0.1" and 0.2" ID. 0.2" will be the shorter one.	Blanchard	Concur		CLOSED

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201305-01	May 2013 Passive Plate Motion Sensors Peer Review	Peer-01	Proposal to add accelerometers to the back of several NSTXU internal passive plates to measure the motion of the plates resulting from disruptions. (Titus P.) The purpose of these accelerometers should be to benchmark disruption loading and to watch the effects of slop impact. Slop impact probably be "heard" on the outside of the vessel at the bracket attachments. Benchmarking disruptions is best done at the mid span of the passive plates (primary & secondary), (maybe upper and lower) - on inside of the vessel.	Kalish		Confirmed as closed via conversation with Mike Kalish on 12/3/14.	CLOSED
201301-01	Jan 2013 TF Turn to Turn Fault Detection Peer Review	Peer-01	Details of the trip circuitry need to be established/documented	Ramakrishnan			CLOSED
201301-02	Jan 2013 TF Turn to Turn Fault Detection Peer Review	Peer-02	Need to submit an Engineering Change Proposal (ECP) of the NSTX-U Requirements	Ramakrishnan			CLOSED
201408-01	Aug 2014 TF Turn to Turn Fault Detection FDR	Chit-01	Check DCCT specification for open fiber detection and add if needed	Ramakrishnan			CLOSED
201408-02	Aug 2014 TF Turn to Turn Fault Detection FDR	Chit-02	Check with Sichta/Lawson that fiber “M” sh1506 has a landing spot in the F/O patch panels in racks 215 and 481	Ramakrishnan			CLOSED
201411-01b	Nov 2014 Halo Current Side Load Blocks Peer Review	Peer-01	(Dudek L) Check (ensure) side load isn’t born by the ceramic ring	Raftopolous	Concur		CLOSED
201411-02b	Nov 2014 Halo Current Side Load Blocks Peer Review	Peer-02	(Dudek L) Add to the maintenance plan to inspect stops for signs of wear, play or other signs of distress	Dudek	Concur		CLOSED
201411-03b	Nov 2014 Halo Current Side Load Blocks Peer Review	Peer-03	(Dudek L) Ensure that these do not lead to too large loads on the ceramic break.	Raftopolous	Concur. Refer to Date Ref 201411-01b		CLOSED