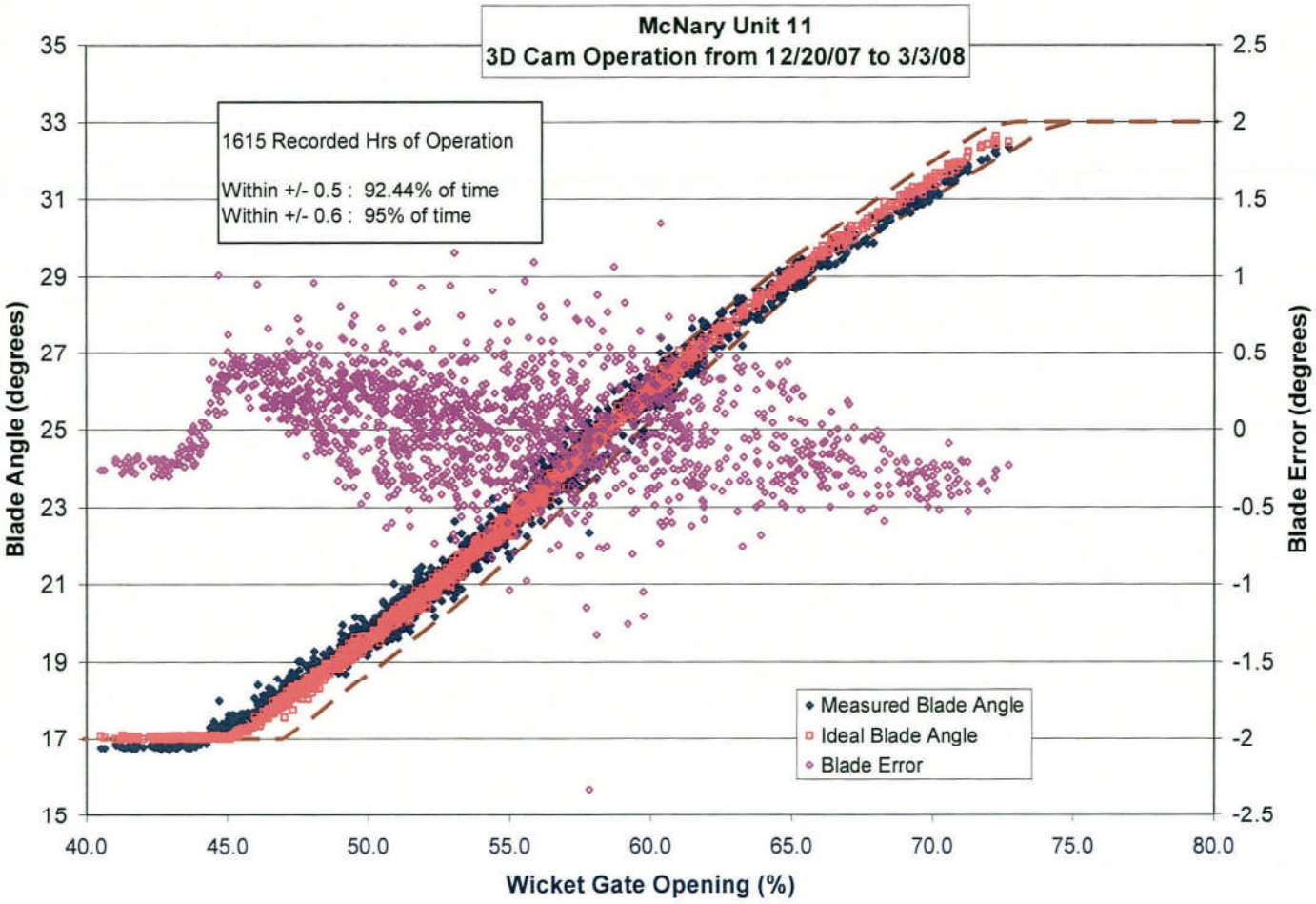
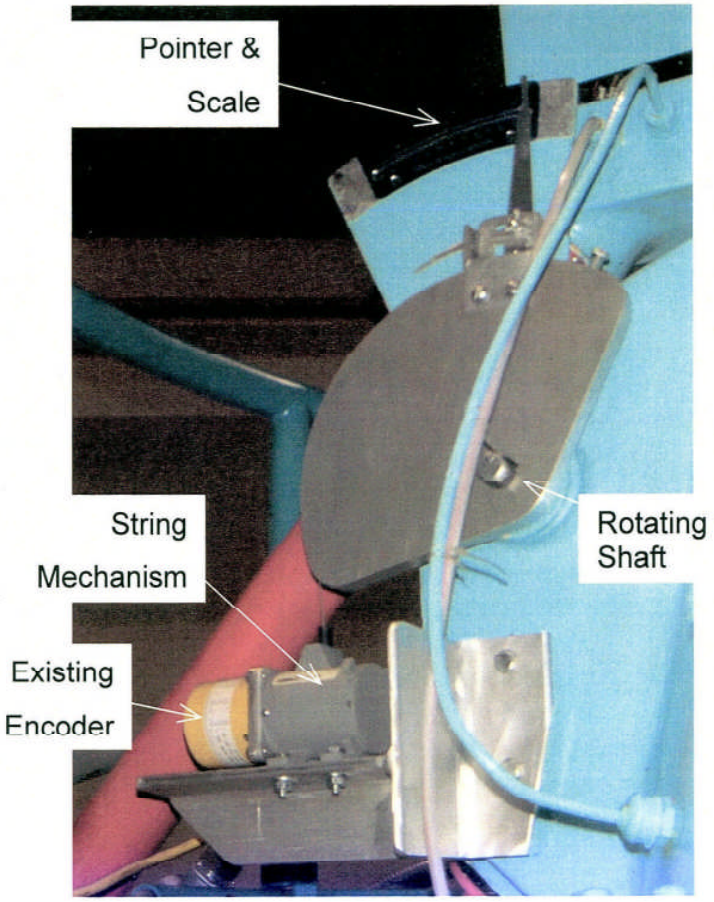
NWW 3D Cam Controllers
Follow-On Efforts (since last HOT) – MCN:

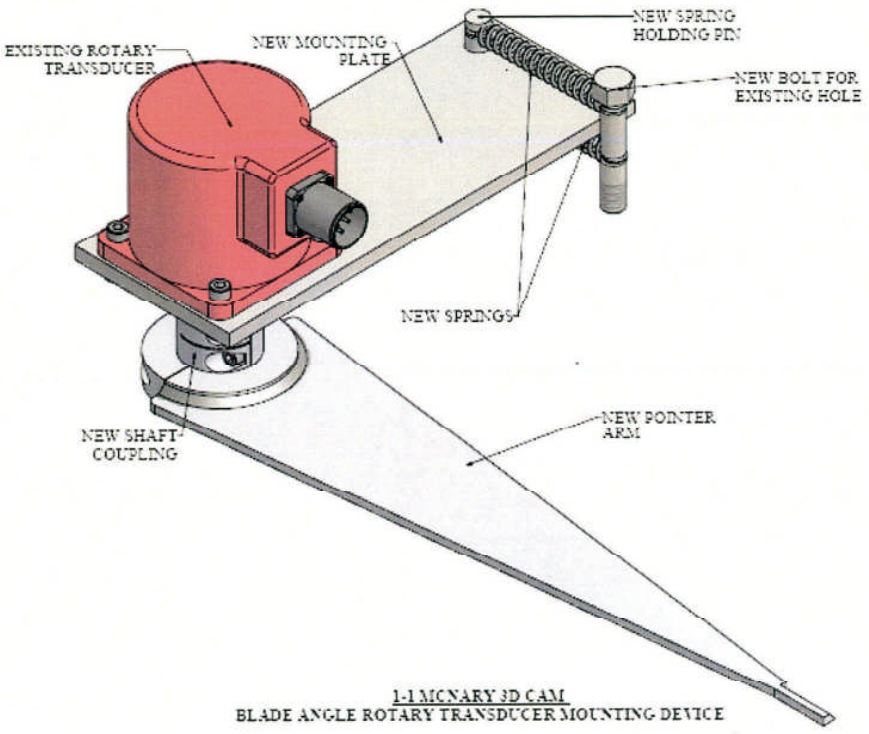
Mar 08 SURVEY: Failed pressure x-ducer replaced by Project personnel (corrected head indication to Units 11-14)



NWW 3D Cam Controllers
Follow-On Efforts (since last HOT) – MCN:

- Design for OH transducer mounting modification sent to Project 21 Feb





NWW 3D Cam Controllers
Follow-On Efforts (since last HOT)

- IH:
  - Data Collection for Abbreviated Survey Forthcoming
  - Project troubleshooting frequent 3D Cam Controller faults (Units 1 & 3).
    - Sluggish blade response noted.
    - Potential hardware modifications required.
    - Software and/or hardware differences between IH and other sites being investigated.
  - Anticipated schedule:
    - Unit 1 repairs in-place mid-March.
    - Unit 3 repairs in-place 31 March.
- LGR & LMO:
  - No significant issues were identified in Fall 07 surveys
  - Data for Abbreviated Survey being collected (week of 11 Mar)
  - Results to be compiled / distributed next few weeks

NWW 3D Cam Controllers FY08

- All NWW Projects:
  - New Hard Cams to be Fabricated / Installed
  - Abbreviated Surveys to be repeated mid-fish season (July timeframe)

NWW 3D Cam Controllers
Follow-On Efforts (since last HOT)

- IH:
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  - Results to be compiled / distributed next few weeks

December 19, 2007

Corps Hydro-Optimization Team Meeting
Minutes
December 6, 2007
Portland, Oregon

Name	Organization	Telephone
Murphy, Tom – co chair	BPA	503-230-5527
Tiffany Newton	BPA	503-230-4217
Ken Earlywine	HDC	503-808-4288
Jim Kerr	HDC	503-808-4250
Nelson, Richard	CENWP-HDC-E	503-808-4275
Robert Wittinger	HDC	503-808-5162
Robert VanderBorg – co chair	CENWP	503-808-4331
Lee Sheldon	HDC	503-808-4298
Ed Miska	HDC	503-808-4294
Travis Togo	BPA	503-230-3094
Eve James	BPA	503-230-5558
Dan Ramirez	HDC	503-808-4271
Faulkner, Don	Corps	503-808-3934
Sojka, Leon	HDC	503-808-4299
Hacker, Kathy	BPA	503-230-4295

Introductions, review agenda, adopt minutes from 8/14/07
Tom Murphy (BPA, co-chair) led introductions, reviewed the agenda, and the August 14, 2007 minutes were reviewed and adopted by the team.

Roles & Responsibilities & HOT Team Charter
Dick Nelson (Corps) reaffirmed roles and responsibilities of key leads and setting direction for the team, referencing the HOT Team Charter. The project managers are responsible for developing subagreements, scoping the project, providing clear guidance, and direction on milestones and project completion.

- Ken Earlywine – project manager
- Dam Ramirez – technical lead
- Leon Sojka – control & tech team lead
- Carolyn Foote – Walla Walla lead

Research and Development Roadmap

Tom Murphy (also, R&D POC) reported on the status of working on developing the draft Roadmap plan with the Corps by April 2008. He mentioned that BPA is funding the project. This is a new Research and Development approach. All comment/project concerns need to be sent to Tom Murphy by February 2008 to be included in the draft plan. The final Roadmap plan will be completed by summer 2008. Also, Tom mentioned that copies of the Wind Integration Report are available in BPA's library.

Action: Tom Murphy requested that Dick Nelson work on an analysis regarding cycling units/economic assessment comparison to Norwegian study.

TYPE 1 Optimization

Dan Ramirez presented the McNary Unite 9 Perturbation Cycle. The display showed the wicket gates on squeeze and blade angle flat on the cam. The problem is with the blades having a faulty calibration and oil head and coding issues and is unique to McNary. A possible solution is moving the transducers at McNary to another project if funding is available.

Don Faulkner asked questions about the implications of the 3D cam survey results that will be distributed soon and suggested that HDC provide guidance before distribution.

TYPE 2 Optimization

Ed Miska reported that he and Leon Sojka met with TBL. The meeting went very well and the project seems to be moving along; status quo on issues.

Action: Ed Miska review new algorithms for GDACS software for unit commitment start/stop schedule on Feed Forward Program. Ed reported that Dr. Bart Rheinlander from University of Portland (new lead) is working with the maintenance team on coding issues.

Status of Smoothing Curves

Dan Ramirez reported that all the flow tables have been completed at the projects. Albeni Falls was the last one to be submitted a month ago. At this time, no problems have been reported by TMT. There could be funding issues associated if tables need corrections.

Action: Dan Ramirez will follow up on using the right information for the flow tables at the projects.

Feed Forward AGC

Tom Murphy mentioned the need to speed up the Feed Forward AGC project and get it back on track. The purpose of the program is to work on timing issues at the projects.

For example, Chief Joseph does not have project generation points. The efficiency gain will occur with the ability to forecast where to turn units on and off.

Dick Nelson raised questions about TBL's process for forecasting an hour ahead of time. A total of 8 amw will be saved if we start utilizing the Feed Forward Program.

Unit Cycling Costs
Dick Nelson reported on assigning the unit cycling costs project to someone else at the Corps. Costs are due to overheating and synchronization problems and minor fatigue in the turbine runner.

Flushing System
Leon Sojka reported that the flushing system will move to Lower Granite if the system moves there and will require software upgrades. The project is a multi-unit (McNary – generic project actually using only 4 units). Propagation next to follow in the future. Cost is about $250K in the subagreement. If the decision is made the funding will also move to Lower Granite. The team discussed fixing hardware and software problems before moving the funding from McNary. The team discussed whether or not to sign the subagreement now and make amendments later. The team agreed to allocate $30K as a placeholder into the subagreement to cover costs pending the decision whether the 3D cams will move from McNary to Lower Granite. Stay tuned.

Leon also mentioned getting four new Winter Kennedy which will be installed by contractors.

Action: Dan Ramirez need to confirm with Lower Granite if the 3D cams are moving.

Action: Bob vanderBorg will follow-up on funding amendment for subagreement.

Blade Angle Measurement
Leon Sojka mentioned that JDA unit 16 is out of service. The team discussed sensor synchronization. Questions were raised on the selection of the sensors. Ed Miska mentioned that the team looked at under water high pressure speed sensors as a main reason for the selection. The installment is scheduled for December 18, followed by testing, and completion of the project is April 1, 2008.

Software Rewrite
Reported that progress is moving forward. Questions were raised about having enough ports to link into the software.

PT/CT Report
Ed Miska presented an executive summary on the PT/CT report that has not been distributed yet. Basically the summary report indicates that there is not enough modeling data to determine whether or not the PT/CT's should be replaced now.

The team expressed concerns about dealing with uncertainty of measuring absolute flow before installing new CT/PT's and better modeling data for CT/PT's for testing purposes of McNary Unit 5. What about propagating to other projects?

Action: Ed Miska will follow-up on PT/CT issues at upcoming meeting.

Chief Joseph Absolute Flow Performance Test

Dan Ramirez presented a package on CHJ units 11-15 on the benefits of absolute flow. The team discussed identifying team members that will be responsible for measuring the bearing shoes, preparing the drawing, and assisting with moving the project forward. Capital project funding has been approved and in progress. The design phase is now starting. Testing and completion will happen between March and October 2008.

For T2, Tom Murphy requested that the team review the run time of algorithms to increase units.

Action: Send your comments to Tom Murphy for T2 algorithm run times.

Action: Lee Sheldon will send a paragraph on load following using different turbine models.

Absolute Flow Benefits – Kaplan Case Study (TD Units 1-14)
Lee Sheldon presented 3 packages on flow benefits of Kaplan vs. Francis turbines. Questions were raised about design head and 1% efficiency gains with varying data sets. Lee explained in detail the differences (i.e., 75% vs. 83% ft. head data)

Tom Murphy mentioned the he needs the flow study curves analysis for finalizing the Benefits Report.

Rod Wittinger discussed the 25 BLH Kaplans investigation and replacement study options starting soon. Rod is the technical lead on this project. The Fisheries are investigating prioritization of units in a power plant and impact to fish operations. Rod highlighted the important of the appropriate support working on this project. Tom Murphy mentioned that Wayne Todd is a representative for BPA. Brian Montana is the technical lead on the project.

Lower Granite Unit 4 – Long Term Plan Needed for Accusonics Installation
Dan Ramirez reported on accusonics installation problems for absolute flow without fish screens. Water damage caused breaker damage. Reviewing vertical and horizontal options for the repair. A long-term plan needs to be developed to avoid this problem again. Rod requested that we form a PDT team to work on this project. Costs approximately $100K and likely to completed in FY08.

Action: Dan Ramirez will pull together an accusonics team. Tom Murphy, Rod Wittinger, and Dan Ramirez volunteered.

Amendment 14
For funding purposes, Kathy Hacker recommended not changing amendment 14 and will separate amendment 15 for Lower Granite and McNary.

Action: Tom Murphy will send Robert vanderBorg the Benefits Report information requested for the amendment.

Next Meeting

The team agreed that the next meeting will be in late January or February. Tiffany Newton will confirm the meeting date with the co-chairs. Stay tuned.

LIST OF FOLLOW-UP ACTIONS

Action: Tom Murphy requested that Dick Nelson work on an analysis regarding cycling units/economic assessment comparison to Norwegian study.

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2008 MEETING SCHEDULE FOR JOC

January 31, Rm. 370
March 7 TBA
May 20 TBA
July 10 TBA
September 30 TBA
November 21 TBA

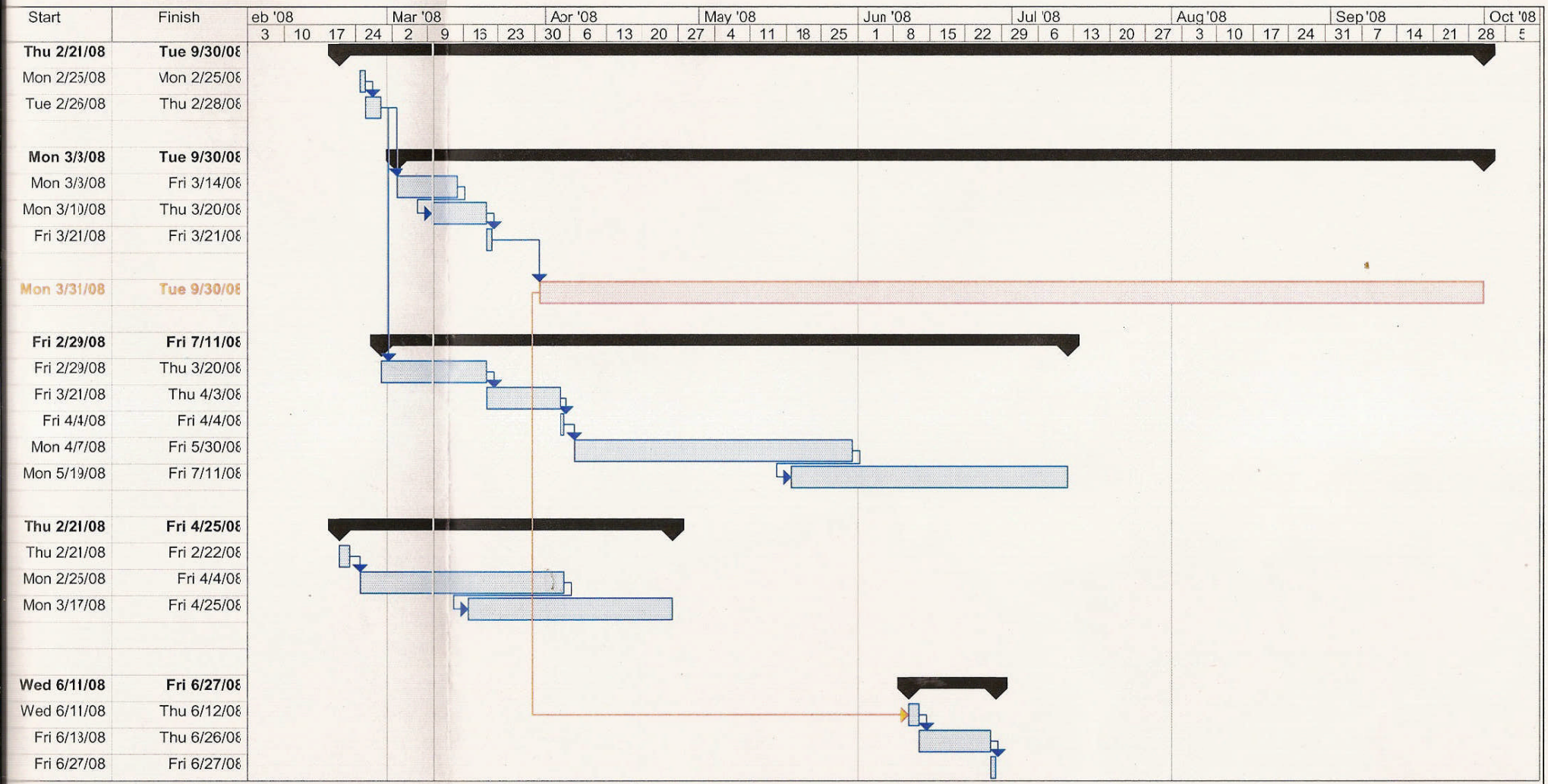
	A	B	C	D	E	F	G
1	**SUBJECT AREA**	**NEW ?**	**ACTION**	**RESPONSIBILITY**	**DATE INITIATED**	**DUE DATE**	**STATUS/COMMENTS**
2	**Administrative**		Prepare list of all studies that should be available (including PM reports and HDC); place on FCRPS website	HDC team leads	1/23/07		
3		*	Set up meeting for R&D Roadmap impacts to CEATI	Murphy	12/6/07		w/Clune, Kottner et al
4		*	Write paragraph Kaplan vs. Francis summary and distribute to team	Sheldon	12/6/07		regulations vs. load following
5			Provide Benefits Report - seeking input from Team next 3 to 4 months	Murphy	8/14/07		
6		*	Follow- up potential moving 3D Cams from McNary to LWG	Ramirez	12/6/07		
7		*	Follow-up with Wayne Todd about BLH Kaplan replacement options	Murphy	12/6/07		
8		*	Form PDT team for Accusonics Installation	Ramirez	12/6/07		Ramirez, Wittinger, Murphy et al
9		*	Send vanderBorg benefits information for amendment	Murphy	12/6/07		
10			Follow up if EPRI testing falls under CEATI program	Kerr	8/14/07		
11	**Type 1 optimization**	*	Follow-up distribution for PT/CT Report coming out	Miska	12/6/07		
12		*	Work on 3D Cams Efficiency Report (MCN & IHR)	Ramirez	12/6/07		
13			Provide revised Gate Blade Controller (electronic 3-D cam) block diagrams	Nelson	8/14/07		
14			3-D cams on Lower Columbia - develop costs, schedules, scope of proposal	van der Borg	1/23/07	Dec-07	include rewrites for NWW; take to capital workgroup
15			Document economic benefit of having accurate absolute flow measurement compared to having only relative flow data for use by the T2 load sharing optimization program (both Kaplan and Francis)	Sheldon	9/12/06	Jul-07	Identify upper limit total life cycle costs for each unit
16			Discuss deadband criteria in T2	Murphy, Miska	1/23/07	Dec-07	
17			Encourage TBL to develop a schedule to meet ICCP deployment date	Murphy	1/23/07		
18			FY 07 T2 list: identify tasks and schedule for ACSI and HDC	Miska	5/16/07		Identify which group is responsible for work
19			Group requested a project scope schedule (T2)	Miska, Murphy	8/14/07		
20		*	Check on using the flow tables at the projects	Ramirez	12/6/07		
21			Follow up on Albeni Falls curves/flow tables needed for Columbia Vista	Ramirez	8/14/07		Informtion for Eve James & Travis Togo
22			Include following additonal elements to Absolute Flow Benefits Study:	Sheldon	8/14/07		
23			- Kaplans: constrained case (TD Units 1-14, constrained per FPP)		8/14/07		
24			Follow-up with Walla Walla on design issues for McNary nethead	Nelson	8/14/07		
25			Machine 3-D cam operational survey: present summary at next HOT meeting	Allen	5/16/07	8/14/07	

Type 2 Optimization FY08 Work
T2 Programming

- GMT:
  - User interface / screen displays to be revised.
    - Programming effort scheduled for this summer
    - NRTO displays to be used as template
- ASCI:
  - Task order being finalized
  - Add ICCP Parameters
    - BPA / HDC to refine parameter list
  - Resolve conflict between Maximum Allowable Difference Algorithm and T2 E&D
  - Work on Feed Forward Algorithm deferred until data available (earliest FY09)

Type 2 Optimization
Flow Tables Status

- Smoothing of all tables completed FY07
  - exception AF early FY08
- All tables transmitted:
  - BPA (for use in NRTO & Columbia VISTA)
  - GMT (for use with T2)
- Iterative process, all fixes complete
- GMT has deployed tables at B1, B2, JD, TD, McN & CJP (partial).
- GMT will deploy at remaining projects with GDACS updates
- NO remaining FY08 work on flow tables


Start
Finish
eb '08
Mar '08
Apr '08
May '08
Jun '08
Jul '08
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3 10 17 24 2 9 15 23 30 6 13 20 27 4 11 18 25 1 8 15 22 29 6 13 20 27 3 10 17 24 31 7 14 21 28 5
Thu 2/21/08 Tue 9/30/08
Mon 2/25/08 Mon 2/25/08
Tue 2/26/08 Thu 2/28/08
Mon 3/3/08 Tue 9/30/08
Mon 3/3/08 Fri 3/14/08
Mon 3/10/08 Thu 3/20/08
Fri 3/21/08 Fri 3/21/08
Mon 3/31/08 Tue 9/30/08
Fri 2/29/08 Fri 7/11/08
Fri 2/29/08 Thu 3/20/08
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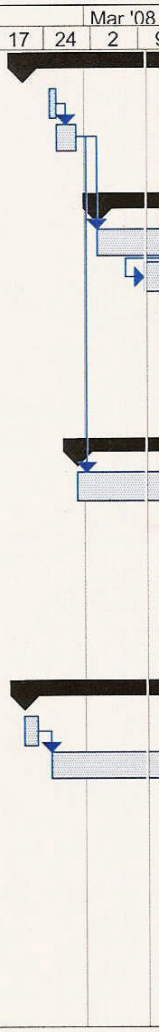
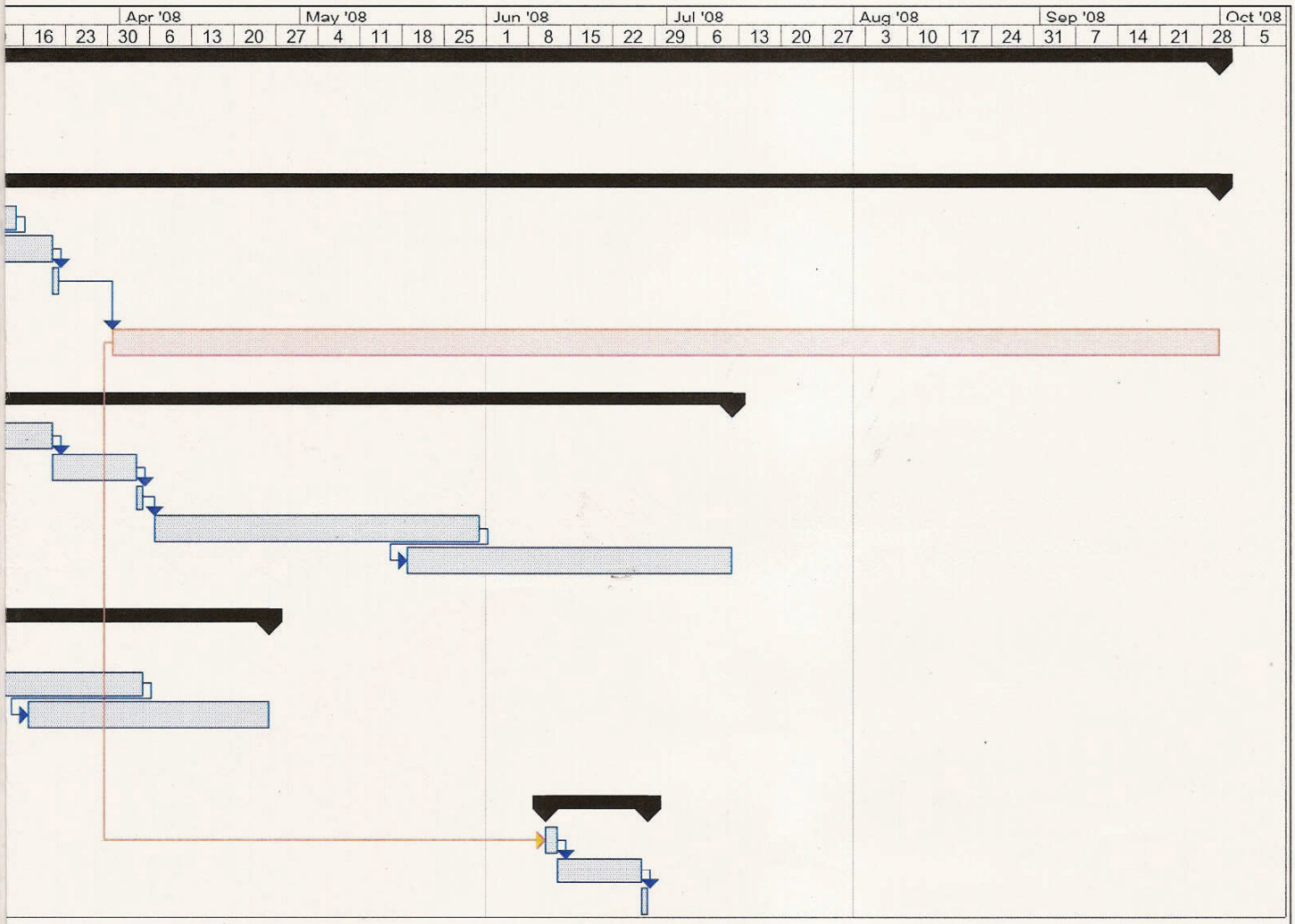
Thu 2/21/08 Fri 4/25/08
Thu 2/21/08 Fri 2/22/08
Mon 2/25/08 Fri 4/4/08
Mon 3/17/08 Fri 4/25/08
Wed 6/11/08 Fri 6/27/08
Wed 6/11/08 Thu 6/12/08
Fri 6/13/08 Thu 6/26/08
Fri 6/27/08 Fri 6/27/08

ID	Task Name	Duration	Start	Finish
1	**FY08 3D Cam Support**	**159 days**	**Thu 2/21/08**	**Tue 9/30/08**
2	SOW to NWW for funding	1 day	Mon 2/25/08	Mon 2/25/08
3	NWW provide HDC funding	3 days	Tue 2/26/08	Thu 2/28/08
4				
5	**Conduct Abbreviated Surveys**	**152 days**	**Mon 3/3/08**	**Tue 9/30/08**
6	Acquire data for review	10 days	Mon 3/3/08	Fri 3/14/08
7	Analyis Data	9 days	Mon 3/10/08	Thu 3/20/08
8	Provide Report to NWW	1 day	Fri 3/21/08	Fri 3/21/08
9				
10	**FISH SEASON - ALL UNITS AVAIL FY08**	**6.6 mons**	**Mon 3/31/08**	**Tue 9/30/08**
11				
12	**New Hard Cams**	**96 days**	**Fri 2/29/08**	**Fri 7/11/08**
13	Analyis existing hard cams	3 wks	Fri 2/29/08	Thu 3/20/08
14	Establish new hard cam profiles	2 wks	Fri 3/21/08	Thu 4/3/08
15	Provide design to NWW	1 day	Fri 4/4/08	Fri 4/4/08
16	NWW PO to provide new cams	2 mons	Mon 4/7/08	Fri 5/30/08
17	NWW Install new cams	2 mons	Mon 5/19/08	Fri 7/11/08
18				
19	**McNary Oil Head Trans Bracket**	**47 days**	**Thu 2/21/08**	**Fri 4/25/08**
20	HDC provide design to McNary	2 days	Thu 2/21/08	Fri 2/22/08
21	McN fabricate brackets	6 wks	Mon 2/25/08	Fri 4/4/08
22	McN install brackets	6 wks	Mon 3/17/08	Fri 4/25/08
23				
24				
25	**Provide follow on Survey Reports**	**13 days**	**Wed 6/11/08**	**Fri 6/27/08**
26	Aquire data for review	2 days	Wed 6/11/08	Thu 6/12/08
27	Analyis Data	2 wks	Fri 6/13/08	Thu 6/26/08
28	Provide Report to NWW	1 day	Fri 6/27/08	Fri 6/27/08



Project: 3D Cam FY08 Schedule Feb
Date: Mon 3/10/08

Task
Split
Progress
Milestone
Summary
Project Summary



External Tasks

Deadline

External Milestone