Cook RWP/Work Order Optimization

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ISOE/NATC, 2013

AEP AMERICAN ELECTRIC POWER

Goal

- FIRST to LAST!
- **DOSE ACCOUNTABILITY AND PERFORMANCE**

- THEN!!!
- Stop Replanning Model Work Orders
  - What does this mean
  - Model Work Orders (MWO)
    - In Database Terms, a ‘parent’ relationship
    - Are ‘tasked’ at predefined periodicity
    - ‘Tasked’ MWOs get ‘new’, unique WO# each time the MWO is tasked
  - Once a tasked MWO has been planned and worked, replanning is pretty much rework

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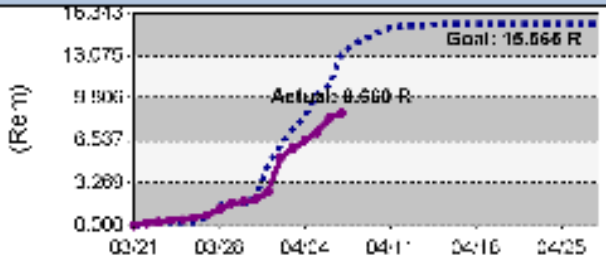
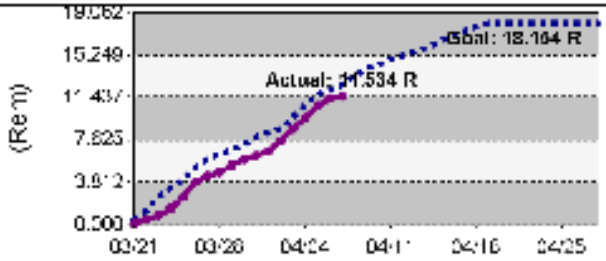
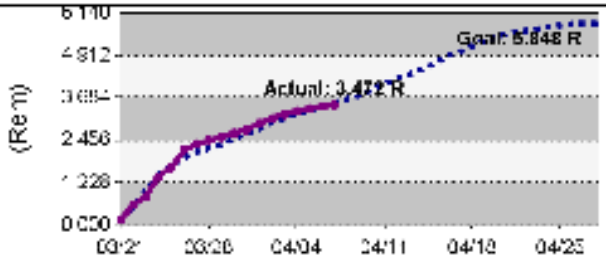
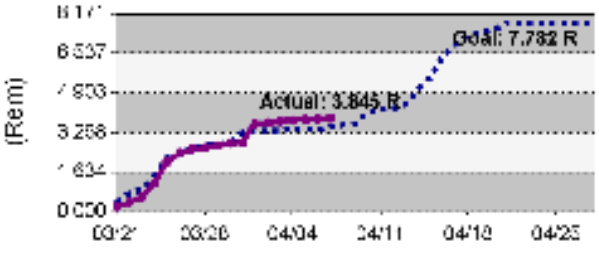
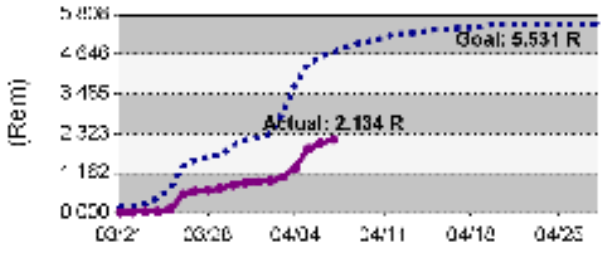
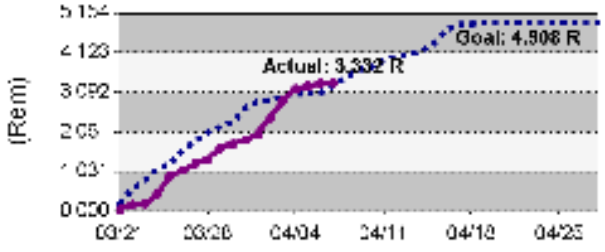
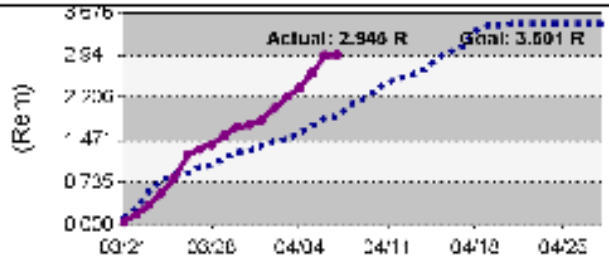
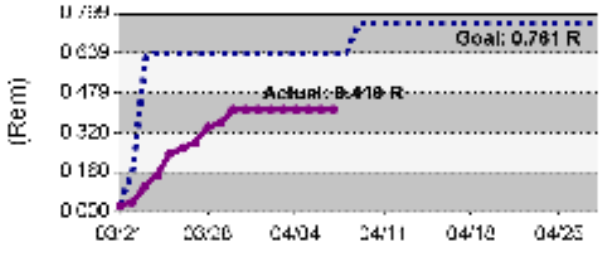
U2C20 Outage Graphs: By Manager

Saturday April 07, 2012

Group (Click to Drill Down)		Details					Graph
		Est (R)	Act (R)	%	# Ind	Hrs	
Jim Ross (s007119)	Daily:	2.366	0.400	16.9 %	40	146.5	
	Total To Date:	13.210	8.660	65.6 %	284	3722.1	
Randy Keppeler (i472582)	Daily:	0.446	0.146	32.7 %	197	830.4	
	Total To Date:	12.557	11.534	91.9 %	2005	37715.3	
Bob Hite (s236366)	Daily:	0.077	0.040	51.4 %	77	308.2	
	Total To Date:	3.527	3.472	98.4 %	727	16011.3	
Sergio Vazquez (s011332)	Daily:	0.024	0.033	135.8 %	48	151.6	
	Total To Date:	3.458	3.845	111.2 %	517	7773.3	

U2C20 Outage Graphs: By Owner - For: Randy Keppeler (i472582)

Saturday April 07, 2012

Group (Click to Drill Down)		Details					Graph
		Est (R)	Act (R)	%	# Ind	Hrs	
John Wygant (i983011)	Daily:	0.123	0.096	78.0 %	48	184.5	
	Total To Date:	4.707	2.134	45.3 %	375	2878.1	
Thomas Tillstrom (i891114)		Est (R)	Act (R)	%	# Ind	Hrs	
	Daily:	0.117	0.018	15.7 %	18	70.6	
	Total To Date:	3.217	3.332	103.6 %	220	4781.9	
Bob Nitz (s002056)		Est (R)	Act (R)	%	# Ind	Hrs	
	Daily:	0.056	0.011	19.2 %	62	233.4	
	Total To Date:	1.901	2.945	155.0 %	763	13086.2	
Ken Michael (s214835)		Est (R)	Act (R)	%	# Ind	Hrs	
	Daily:	0.000	0.000	0.0 %	0	0.0	
	Total To Date:	0.641	0.410	64.0 %	32	152.6	

Cook Plant U2C20 Group Statistics

Group: RWP 12-2128

From: 04/07/2012 | To: 04/07/2012

Work Request	Craft	Radworker	RWP Owner	RWP Manager	RWP - Task	Date Out	Dose mR	Hrs
5535024406: MTM, 2-RH-117 REPACK VALVE / REMOVE BA BUILD-UP							**50.4**	**14.1**
	D13000: D13 VALVE TECHNICIANS						**50.4**	**14.1**
		MEYER, BRUCE A	John Wygant (I983011)	Randy Keppeler (I472582)	122128 - 01	04/07/2012 05:10	16.5	2.5
		CLAYPOOL, ANDREW W	John Wygant (I983011)	Randy Keppeler (I472582)	122128 - 01	04/07/2012 05:10	13.0	2.5
		MEYER, BRUCE A	John Wygant (I983011)	Randy Keppeler (I472582)	122128 - 01	04/07/2012 01:14	12.3	2.1
		CLAYPOOL, ANDREW W	John Wygant (I983011)	Randy Keppeler (I472582)	122128 - 01	04/07/2012 01:14	8.6	2.1
		CAMPBELL, DAVID R	John Wygant (I983011)	Randy Keppeler (I472582)	122128 - 01	04/07/2012 01:16	0.0	2.1
		CAMPBELL, DAVID R	John Wygant (I983011)	Randy Keppeler (I472582)	122128 - 01	04/07/2012 05:10	0.0	2.5
		MEYER, BRUCE A	John Wygant (I983011)	Randy Keppeler (I472582)	122128 - 01	04/07/2012 05:42	0.0	0.1
		CAMPBELL, DAVID R	John Wygant (I983011)	Randy Keppeler (I472582)	122128 - 01	04/07/2012 05:42	0.0	0.1
5539154101: MTM, 2-ICM-311, DISASSEMBLE AND INSPECT VALVE INTERNALLY							**15.0**	**6.5**
5540124017: MTM, (PH) 2-IMO-910/911, 2-TK-33 (24") SETUP FREEZE SEAL							**11.2**	**41.2**
5540124016: MTM, 2-IMO-910/911, 2-TK-33 (24") SET AND REMOVE FREEZE SEAL							**10.2**	**61.5**
5540124004: MTM, 2-IMO-910, DISASSEMBLE/REASSEMBLE VALVE							**7.4**	**35.7**
5540124011: MTM, (PH05) 2-IMO-911, DISASSEMBLE VALVE							**1.1**	**9.7**
5540124005: MTM, 2-IMO-911, DISASSEMBLE/REASSEMBLE VALVE							**0.3**	**1.5**
06383077: Repair - troubleshoot 12-SF-139 drain valve on RWPfilter drain.							**0.2**	**0.3**
5537966701: MTM 2-IMO-350, REFURBISH VALVE TO STOP SEAT LEAKAGE							**0.0**	**0.1**
							95.8	**170.4**

Generated: 04/07/2012 09:13

	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM
1																
2	Various	Various	Kyle Patterson		Various	Bob Hite	Bob Hite	Various	John Wyga	John Wyga	Various	Randy Ker	Randy Ker	Bob Kerhir	Randy Ker	Various
3	Shane Lies	Shane Lies	Jim Ross		Shane Lies	Bob Hite	Bob Hite	Shane Lies	Randy Ker	Randy Ker	Shane Lies	Randy Ker	Randy Ker	Toby Woo	Randy Ker	Shane Lies
4	122162	122163	122164	122165	122167	122169	122170	122174	122175	122176	122177	122179	122180	122187	122195	122197
5	77.24	0.5	0	0	0	0	0	0	105	28	44	0	0	0	0	0
6	240.725	4	0	0	0	0	0	0	105	28	236	0	0	301.429	0	0
7	475.576	6.28	30	0	0	0	0	38.4	105	28	236	0	0	529.5	0	0
8	581.529	6.28	30	0	0	0	0	86.4	105	28	236	0	0	538.444	0	0
9	662.16	6.28	30	0	0	0	0	134.4	105	36	236	0	0	539	0	0
10	708.058	9.346	30	0	0	0	0	156.444	105	654	236	0	0	539	0	0
11	738.921	12.412	30	0	0	0	40	172	220	654	236	0	0	539	0	9
12	772.332	15.121	30	0	0	1	40	172	235	654	236	0	0	539	0	9
13	805.576	17.401	30	0	0	2	40	172	235	654	236	0	0	539	0	18
14	871.653	19.681	30	0	0	2	40	180	235	662	236	0	0	539	0	18
15	908.73	19.681	30	0	0	2	40	204.5	235	662	236	0	0	539	0	18
16	959.653	21.556	30	0	0	2	40	234.5	235	662	236	0	0	539	0	18
17	1008.051	25.961	30	0	0	2	40	246	235	662	236	0	9.583	539	0	18
18	1038.545	27.241	30	0	0	3	40	246	705.833	662	236	0	18	539	0	18
19	1108.575	43.521	30	0	2	3	40	246	1197.5	662	236	0	18	539	0	18
20	1165.433	59.001	30	0	2	3	40	246	1466	662	236	0	18	539	0	18
21	1263.427	59.001	30	0	2	3	40	246	1625	662	236	0	18	539	0	18
22	1304.804	59.001	30	0	2	3	40	246	1625	662	236	0	18	539	3	18
23	1368.082	60.001	30	0	2	3	40	246	1675	662	236	0	18	539	4	18
24	1421.993	60.001	30	0	2	3	40	246	1675	662	236	0	18	539	5	18
25	1492.62	60.001	30	0	2	3	40	246	1675	662	236	0	18	539	5	18
26	1572.479	60.001	30	0	2	3	40	250	1690	662	236	0	18	539	5	18
27	1607.99	60.001	30	0	2	3	40	254	1690	662	236	0	18	539	5	18
28	1625.634	61.001	30	6	2	3	40	254	1690	662	236	0	18	539	5	18
29	1662.355	61.001	30	6	2	3	40	254	1690	670	236	0	18	539	5	18
30	1733.518	61.001	30	6	2	3	40	254	1690	678	289	0	18	564.75	5	18

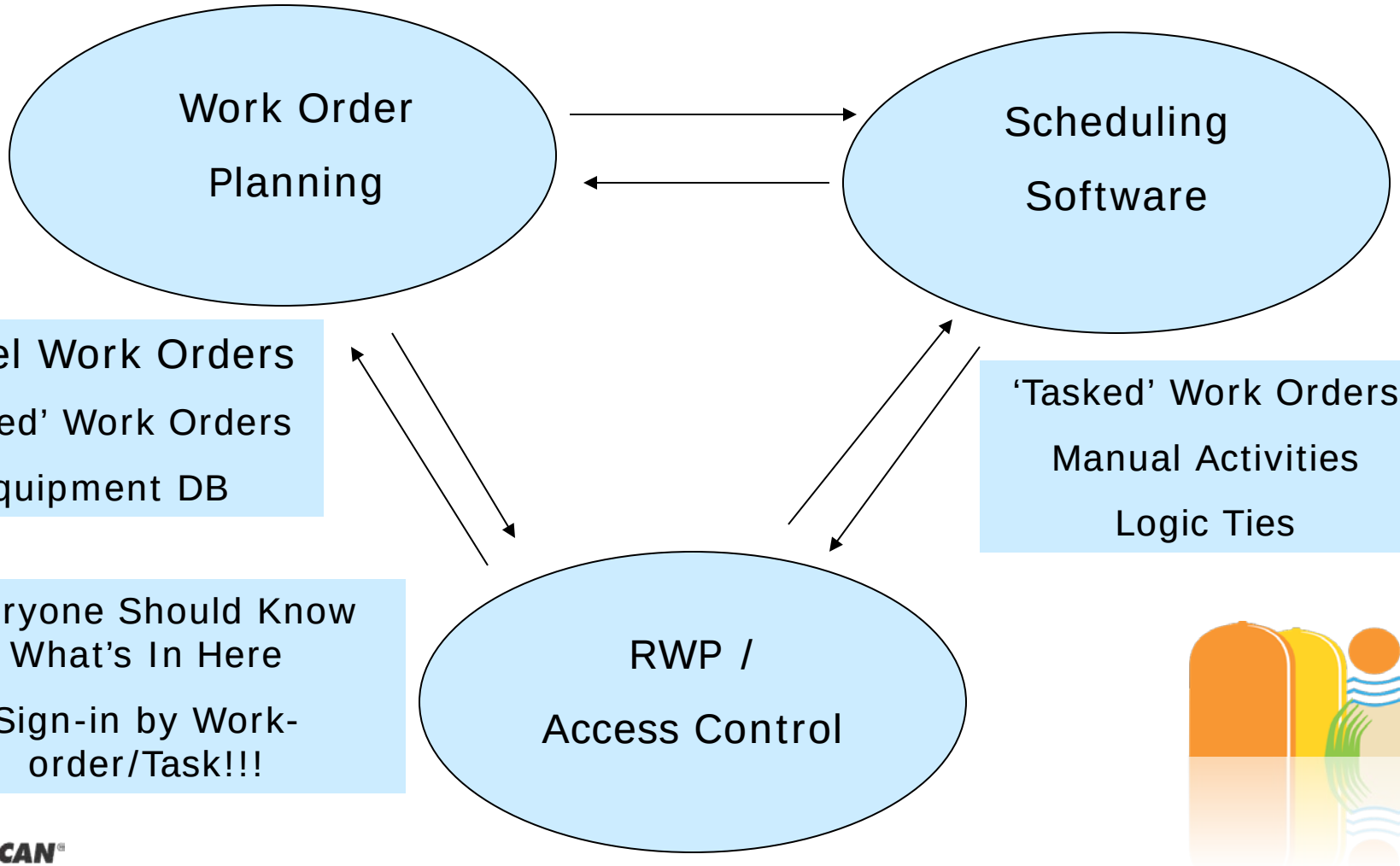
Sheet1 Sheet2 Sheet3

Ready

Goal

- FIRST and LAST! DOSE ACCOUNTABILITY
- THEN!!!
- Stop Replanning Model Work Orders
  - What does this mean
  - Model Work Orders (MWO)
    - In Database Terms, a ‘parent’ relationship
    - Are ‘tasked’ at predefined periodicity
    - ‘Tasked’ MWOs get ‘new’, unique WO# each time the MWO is tasked
  - Once a tasked MWO has been planned and worked, replanning is pretty much rework

How The Data SHOULD Flow!!



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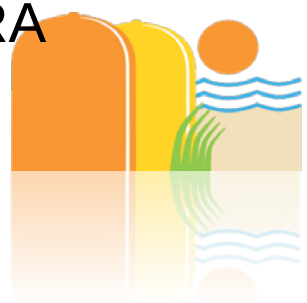
Goal – In The Works

- Dose estimate data is currently driven from the a spreadsheet which sums dose by RWP by Day with supervisors and their manager's names attached
  - More to come on this..... Will be automatic
- Data comes directly from outage work order planning efforts of the Cook ALARA group
  - Not really any different than most ALARA programs produce



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GOAL

- First off.....
  - We Have Computers.....
  - We Have Data.....
    - A Lot of it!!!!!
    - Not being effectively utilized
  - Some Have Better Data Than Others
    - Unfortunately for some
    - Time for some to change
    - But this is for others, perhaps

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GOAL

- That Spreadsheet IS ALL MANUAL!!
- What should this look like????
- Should Highly Qualified People Be
  - Data entering from computer reports to spreadsheets
  - .....For data that is already in a computer database
  - .....With information that is already complete?

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GOAL

- With This, What Should The Goal Be?
- With This, What Should The Goal Be?
- With This, What Should The Goal Be?
- With This, What Should The Goal Be?
- With This, What Should The Goal Be?

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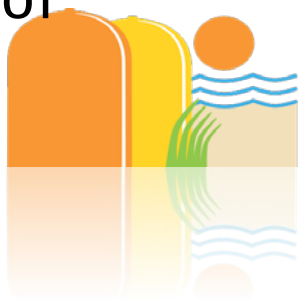
The Plan – Soon!!

- Currently analyzing over 3 million access events
  - All sign-ins by work-order/task
  - Relating back to model work orders
  - Supercomputer using goal-seeking codes to creating optimized work logic based on past performance
    - Working with NATC and University of Illinois supercomputing center



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The Future – Soon!!

- Currently analyzing over 3 million access events
  - Will download optimized performance data into Indus
  - Will apply machine-learning techniques to optimize the data
  - RP humans will not have to ‘re-plan’ previously worked work orders

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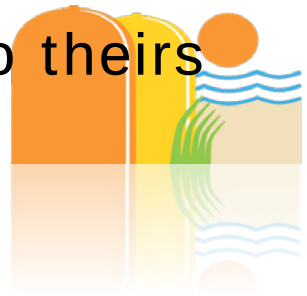
The Future – Soon!!

- Currently analyzing over 3 million access events
  - Will be tracking dose real-time all the way down to work order/task
    - With full capability to roll up to supervisor, manager, VP, CNO?
    - Goes back to graphs
    - Will be automatic
    - Computers will be doing their jobs
    - Humans will be freed back up to do theirs



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