Zagros Engineering

Packaging Line Performance Analysis

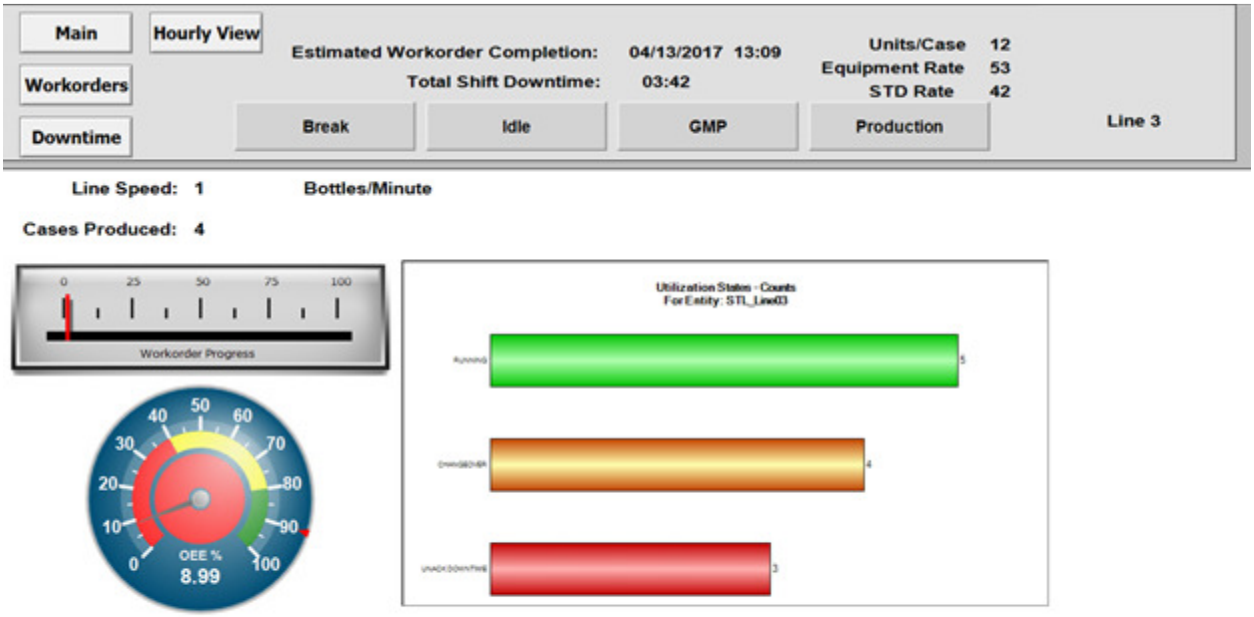
Manufacturing Execution System

Zagros Engineering developed a new Manufacturing Execution System for a manufacturer in St. Louis, MO. The system replaced stacks of hand written forms and eliminated manual entry of this data into the existing ERP system.

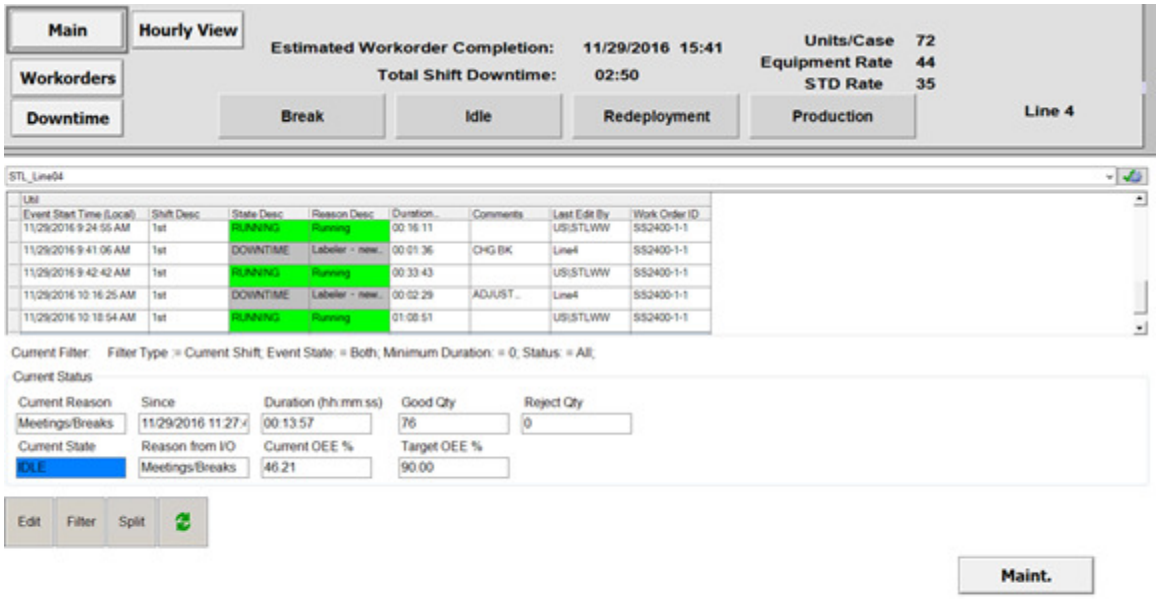
The system is based on Wonderware System Platform and Performance.

The system provides the following capabilities

- The production schedule is made available to the line operators from the existing AS400 based ERP system in real time.
- The system captures production counts and downtime reasons from 7 packaging lines.
- Production and OEE data is imported into the existing corporate AS400 based reporting system.
- The system provides a suite of customized reports.

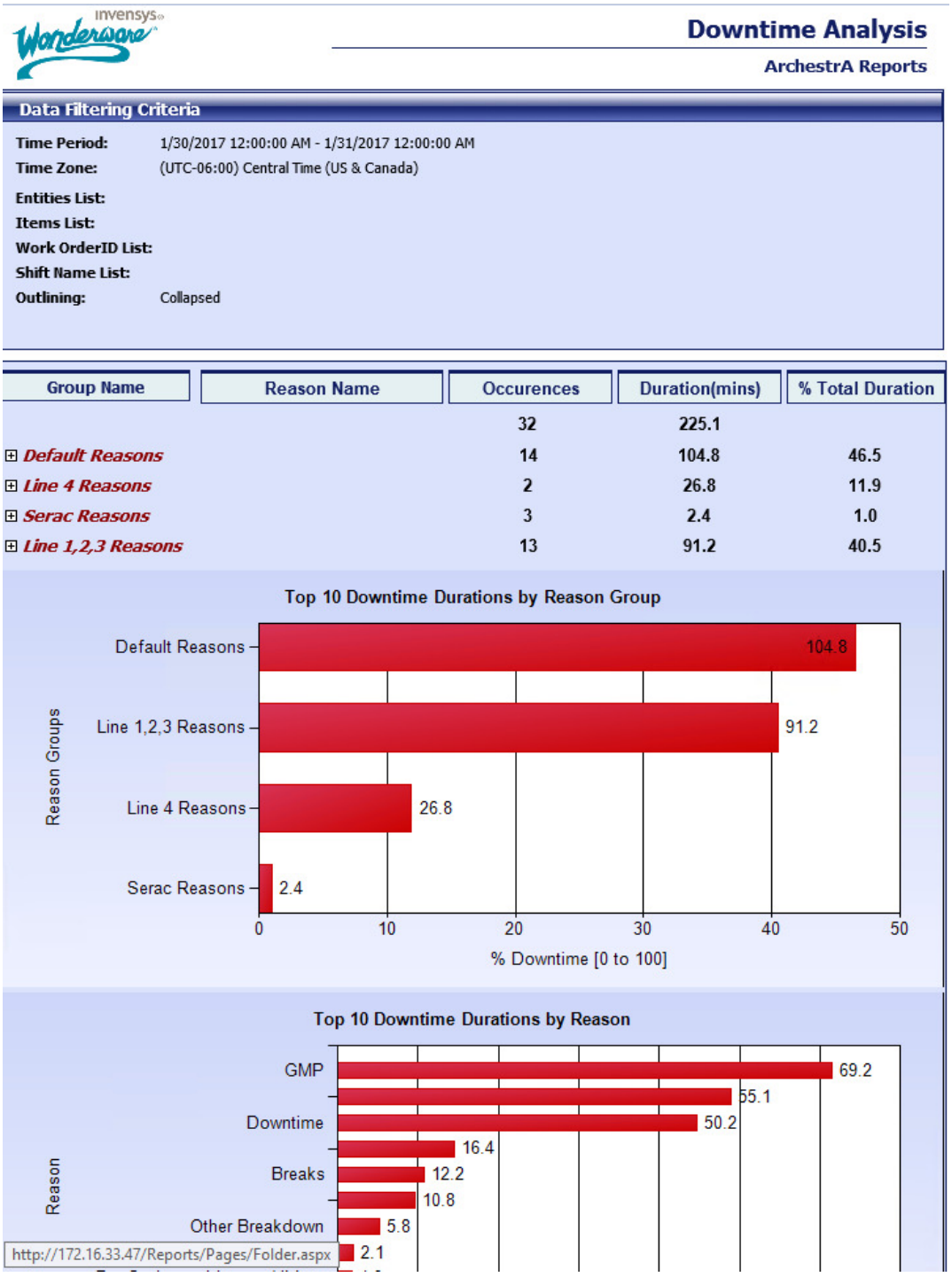


The system allows operators to enter detailed information for downtime events for later analysis.



Downtime Event Entry Screen

Wonderware Performance includes a number of reports that allow the analysis of downtime and production data:



Downtime Analysis

ArchestrA Reports

Data Filtering Criteria

Time Period: 1/30/2017 12:00:00 AM - 1/31/2017 12:00:00 AM

Time Zone: (UTC-06:00) Central Time (US & Canada)

Entities List:

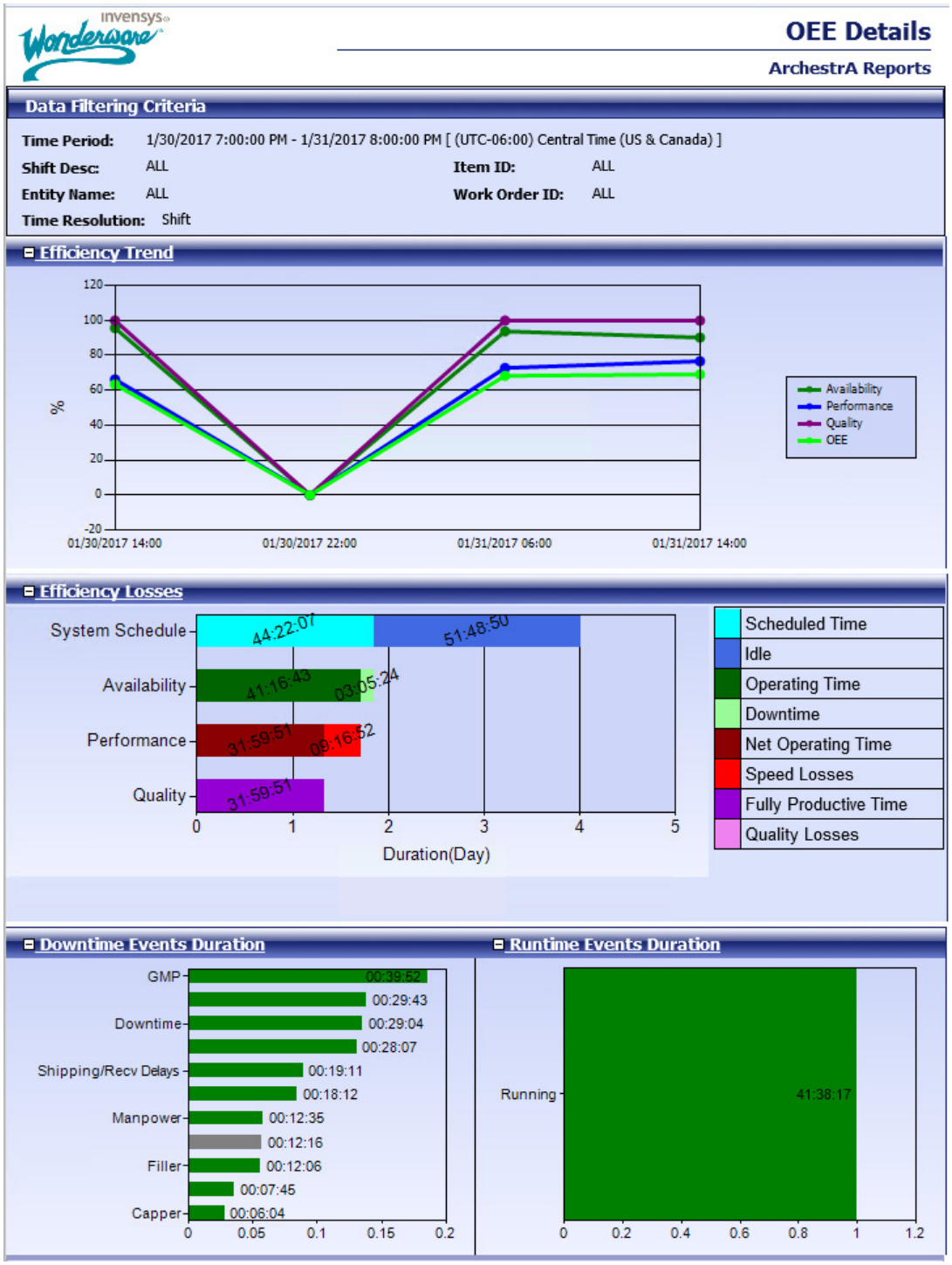
Items List:

Work OrderID List:

Shift Name List:

Outlining: Collapsed

Group Name	Reason Name	Occurences	Duration(mins)	% Total Duration
		32	225.1	
⊞ *Default Reasons*		14	104.8	46.5
⊞ *Line 4 Reasons*		2	26.8	11.9
⊞ *Serac Reasons*		3	2.4	1.0
⊞ *Line 1,2,3 Reasons*		13	91.2	40.5


Invensys
Wonderware
OEE Details
ArchestrA Reports
Data Filtering Criteria
Time Period: 1/30/2017 7:00:00 PM - 1/31/2017 8:00:00 PM [(UTC-06:00) Central Time (US & Canada)]
Shift Desc: ALL
Item ID: ALL
Entity Name: ALL
Work Order ID: ALL
Time Resolution: Shift
Efficiency Trend
%
120
100
80
60
40
20
0
-20
01/30/2017 14:00
01/30/2017 22:00
01/31/2017 06:00
01/31/2017 14:00
Availability
Performance
Quality
OEE
Efficiency Losses
System Schedule
Availability
Performance
Quality
44:22:07
51:48:50
41:16:43
03:05:24
31:59:51
09:16:52
31:59:51
0
1
2
3
4
5
Duration(Day)
Scheduled Time
Idle
Operating Time
Downtime
Net Operating Time
Speed Losses
Fully Productive Time
Quality Losses
Downtime Events Duration
GMP
Downtime
Shipping/Recv Delays
Manpower
Filler
Capper
00:39:52
00:29:43
00:29:04
00:28:07
00:19:11
00:18:12
00:12:35
00:12:16
00:12:06
00:07:45
00:06:04
0
0.05
0.1
0.15
0.2
Runtime Events Duration
Running
41:38:17
0
0.2
0.4
0.6
0.8
1
1.2

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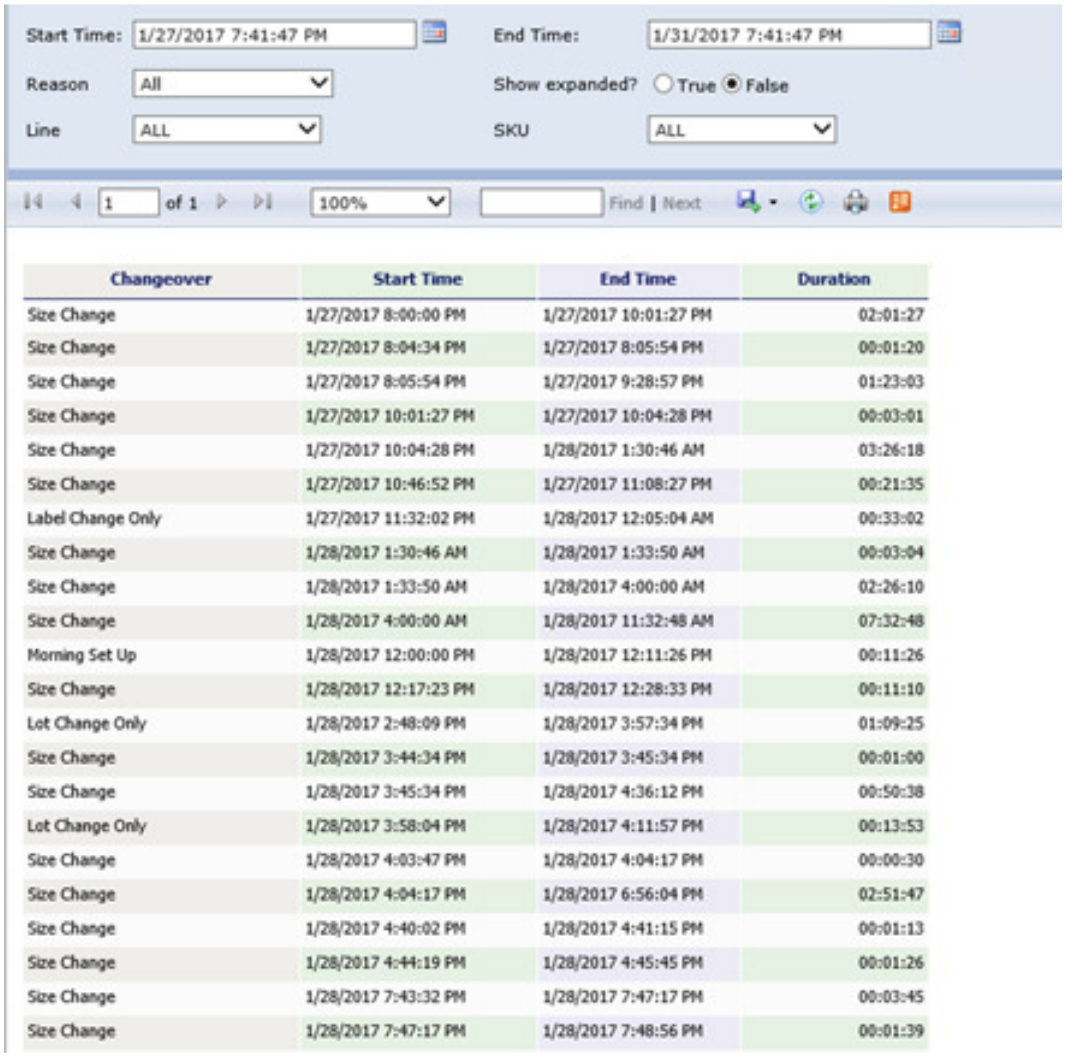
Zagros also developed a suite of custom reports for this project. These reports replaced data collected by hand for daily, weekly and monthly review meetings.

Hourly Production Report

Line	Hour	Workorder	Cases	Personal	Events
STL_Line04	1/30/2017 8:00:00 PM	SW5941-1-1	68	4	⊟
STL_Line05	1/30/2017 8:00:00 PM	SS2219-1-1	76	0	⊞
STL_Line04	1/30/2017 9:00:00 PM	SW5941-1-1	26	0	⊞
STL_Line05	1/30/2017 9:00:00 PM	SS2219-1-1	31	0	⊞
STL_Line02	1/31/2017 6:00:00 AM	SS1090-1-1	118	3	⊞
STL_Line05	1/31/2017 6:00:00 AM	SW6048-1-1	3	0	⊟
STL_Serac	1/31/2017 6:00:00 AM	SS1357-1-1	10	0	⊞
STL_Line02	1/31/2017 7:00:00 AM	SS1090-1-1	229	0	⊞
STL_Line05	1/31/2017 7:00:00 AM	SW6048-1-1	14	0	⊞
STL_Serac	1/31/2017 7:00:00 AM	SS1357-1-1	67	0	⊞
STL_Line02	1/31/2017 8:00:00 AM	SS2552-1-1	1	0	⊞
STL_Line03	1/31/2017 8:00:00 AM	SS3359-1-1	3	0	⊞
STL_Line04	1/31/2017 8:00:00 AM	SW6014-1-1	35	0	⊞
STL_Line05	1/31/2017 8:00:00 AM	SW6048-1-1	69	0	⊞
STL_Offline	1/31/2017 8:00:00 AM	SW6693-1-1	2	0	⊞
STL_Serac	1/31/2017 8:00:00 AM	SS1357-1-1	40	0	⊞
STL_Line02	1/31/2017 9:00:00 AM	SS2552-1-1	11	0	⊞
STL_Line03	1/31/2017 9:00:00 AM	SS3359-1-1	19	0	⊞
STL_Line04	1/31/2017 9:00:00 AM	SW6014-1-1	106	0	⊞
STL_Line05	1/31/2017 9:00:00 AM	SW6048-1-1	78	0	⊞
STL_Offline	1/31/2017 9:00:00 AM	SW6693-1-1	4	0	⊞
STL_Serac	1/31/2017 9:00:00 AM	SS1357-1-1	66	0	⊞
STL_Line02	1/31/2017 10:00:00 AM	SS2552-1-1	253	0	⊞
STL_Line03	1/31/2017 10:00:00 AM	SS3359-1-1	25	0	⊞
STL_Line04	1/31/2017 10:00:00 AM	SW6014-1-1	105	0	⊞
STL_Line05	1/31/2017 10:00:00 AM	SW6048-1-1	58	0	⊞
STL_Offline	1/31/2017 10:00:00 AM	SW6693-1-1	3	0	⊞
STL_Serac	1/31/2017 10:00:00 AM	SS1357-1-1	40	0	⊞
STL_Line02	1/31/2017 11:00:00 AM	SS2552-1-1	66	0	⊞
STL_Line03	1/31/2017 11:00:00 AM	SS3359-1-1	43	0	⊞

Changeover Report

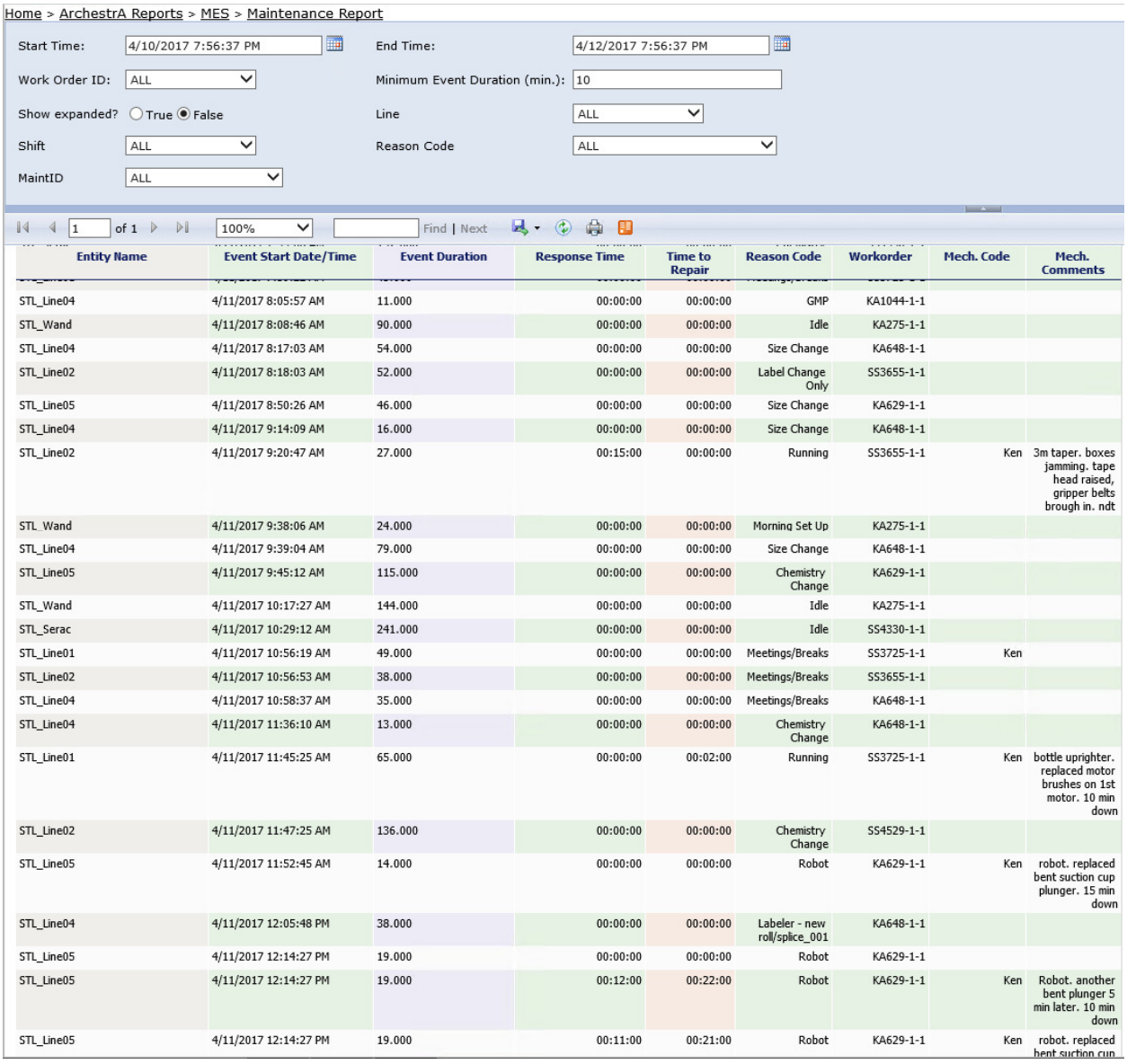
The changeover reports are used by the production management and scheduling team to review the actual amount of time each changeover takes. This allows the scheduling process to use actual data in the planning process. This report also helps identify opportunities for improvement.



Changeover	Start Time	End Time	Duration
Size Change	1/27/2017 8:00:00 PM	1/27/2017 10:01:27 PM	02:01:27
Size Change	1/27/2017 8:04:34 PM	1/27/2017 8:05:54 PM	00:01:20
Size Change	1/27/2017 8:05:54 PM	1/27/2017 9:28:57 PM	01:23:03
Size Change	1/27/2017 10:01:27 PM	1/27/2017 10:04:28 PM	00:03:01
Size Change	1/27/2017 10:04:28 PM	1/28/2017 1:30:46 AM	03:26:18
Size Change	1/27/2017 10:46:52 PM	1/27/2017 11:08:27 PM	00:21:35
Label Change Only	1/27/2017 11:32:02 PM	1/28/2017 12:05:04 AM	00:33:02
Size Change	1/28/2017 1:30:46 AM	1/28/2017 1:33:50 AM	00:03:04
Size Change	1/28/2017 1:33:50 AM	1/28/2017 4:00:00 AM	02:26:10
Size Change	1/28/2017 4:00:00 AM	1/28/2017 11:32:48 AM	07:32:48
Morning Set Up	1/28/2017 12:00:00 PM	1/28/2017 12:11:26 PM	00:11:26
Size Change	1/28/2017 12:17:23 PM	1/28/2017 12:28:33 PM	00:11:10
Lot Change Only	1/28/2017 2:48:09 PM	1/28/2017 3:57:34 PM	01:09:25
Size Change	1/28/2017 3:44:34 PM	1/28/2017 3:45:34 PM	00:01:00
Size Change	1/28/2017 3:45:34 PM	1/28/2017 4:36:12 PM	00:50:38
Lot Change Only	1/28/2017 3:58:04 PM	1/28/2017 4:11:57 PM	00:13:53
Size Change	1/28/2017 4:03:47 PM	1/28/2017 4:04:17 PM	00:00:30
Size Change	1/28/2017 4:04:17 PM	1/28/2017 6:56:04 PM	02:51:47
Size Change	1/28/2017 4:40:02 PM	1/28/2017 4:41:15 PM	00:01:13
Size Change	1/28/2017 4:44:19 PM	1/28/2017 4:45:45 PM	00:01:26
Size Change	1/28/2017 7:43:32 PM	1/28/2017 7:47:17 PM	00:03:45
Size Change	1/28/2017 7:47:17 PM	1/28/2017 7:48:56 PM	00:01:39

Zagros Engineering

Maintenance Report



Home > ArchestrA Reports > MES > Maintenance Report

Start Time: 4/10/2017 7:56:37 PM End Time: 4/12/2017 7:56:37 PM

Work Order ID: ALL Minimum Event Duration (min.): 10

Show expanded? True False Line: ALL

Shift: ALL Reason Code: ALL

MaintID: ALL

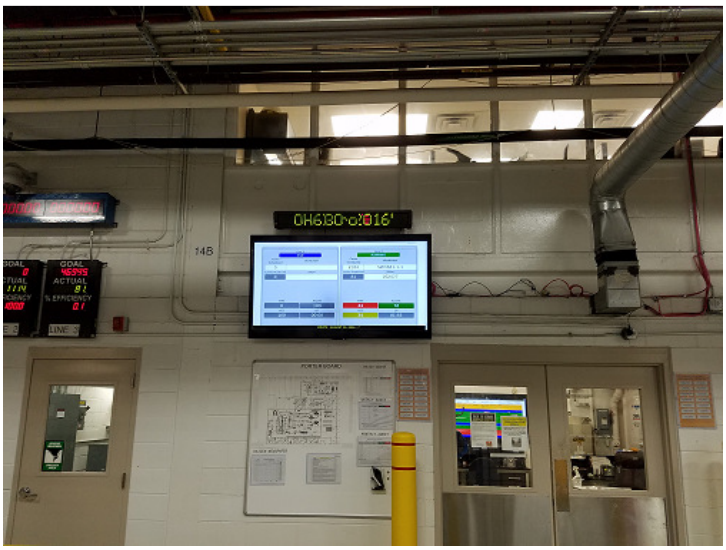
1 of 1 100% Find | Next

Entity Name	Event Start Date/Time	Event Duration	Response Time	Time to Repair	Reason Code	Workorder	Mech. Code	Mech. Comments
STL_Line04	4/11/2017 8:05:57 AM	11.000	00:00:00	00:00:00	GMP	KA1044-1-1		
STL_Wand	4/11/2017 8:08:46 AM	90.000	00:00:00	00:00:00	Idle	KA275-1-1		
STL_Line04	4/11/2017 8:17:03 AM	54.000	00:00:00	00:00:00	Size Change	KA648-1-1		
STL_Line02	4/11/2017 8:18:03 AM	52.000	00:00:00	00:00:00	Label Change Only	SS3655-1-1		
STL_Line05	4/11/2017 8:50:26 AM	46.000	00:00:00	00:00:00	Size Change	KA629-1-1		
STL_Line04	4/11/2017 9:14:09 AM	16.000	00:00:00	00:00:00	Size Change	KA648-1-1		
STL_Line02	4/11/2017 9:20:47 AM	27.000	00:15:00	00:00:00	Running	SS3655-1-1	Ken	3m taper. boxes jamming. tape head raised, gripper belts brough in. ndt
STL_Wand	4/11/2017 9:38:06 AM	24.000	00:00:00	00:00:00	Morning Set Up	KA275-1-1		
STL_Line04	4/11/2017 9:39:04 AM	79.000	00:00:00	00:00:00	Size Change	KA648-1-1		
STL_Line05	4/11/2017 9:45:12 AM	115.000	00:00:00	00:00:00	Chemistry Change	KA629-1-1		
STL_Wand	4/11/2017 10:17:27 AM	144.000	00:00:00	00:00:00	Idle	KA275-1-1		
STL_Serac	4/11/2017 10:29:12 AM	241.000	00:00:00	00:00:00	Idle	SS4330-1-1		
STL_Line01	4/11/2017 10:56:19 AM	49.000	00:00:00	00:00:00	Meetings/Breaks	SS3725-1-1	Ken	
STL_Line02	4/11/2017 10:56:53 AM	38.000	00:00:00	00:00:00	Meetings/Breaks	SS3655-1-1		
STL_Line04	4/11/2017 10:58:37 AM	35.000	00:00:00	00:00:00	Meetings/Breaks	KA648-1-1		
STL_Line04	4/11/2017 11:36:10 AM	13.000	00:00:00	00:00:00	Chemistry Change	KA648-1-1		
STL_Line01	4/11/2017 11:45:25 AM	65.000	00:00:00	00:02:00	Running	SS3725-1-1	Ken	bottle uprighter. replaced motor brushes on 1st motor. 10 min down
STL_Line02	4/11/2017 11:47:25 AM	136.000	00:00:00	00:00:00	Chemistry Change	SS4529-1-1		
STL_Line05	4/11/2017 11:52:45 AM	14.000	00:00:00	00:00:00	Robot	KA629-1-1	Ken	robot. replaced bent suction cup plunger. 15 min down
STL_Line04	4/11/2017 12:05:48 PM	38.000	00:00:00	00:00:00	Labeler - new roll/splice_001	KA648-1-1		
STL_Line05	4/11/2017 12:14:27 PM	19.000	00:00:00	00:00:00	Robot	KA629-1-1		
STL_Line05	4/11/2017 12:14:27 PM	19.000	00:12:00	00:22:00	Robot	KA629-1-1	Ken	Robot. another bent plunger 5 min later. 10 min down
STL_Line05	4/11/2017 12:14:27 PM	19.000	00:11:00	00:21:00	Robot	KA629-1-1	Ken	robot. replaced bent suction cup

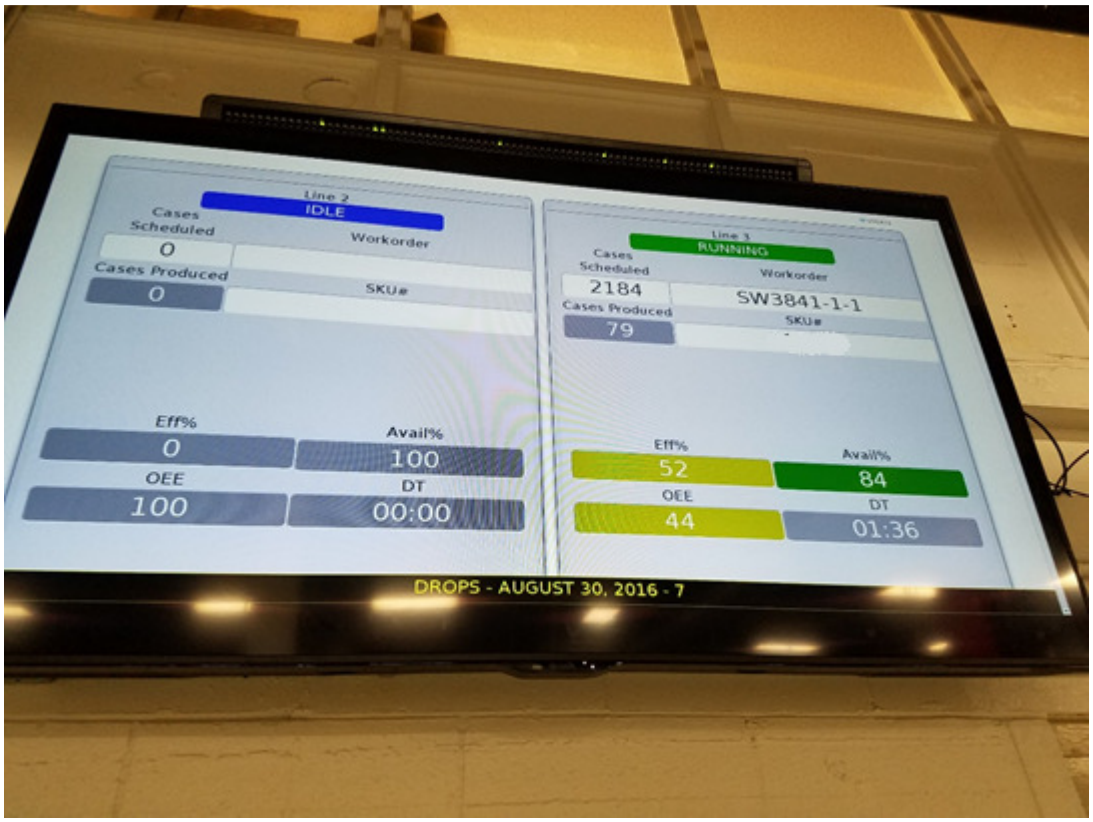
The Maintenance report includes time of response and time to repair data. It also includes any comments made by mechanics which can be entered at the packaging line.

Data Scoreboards provide real time data on each line and in the supervisor's office.

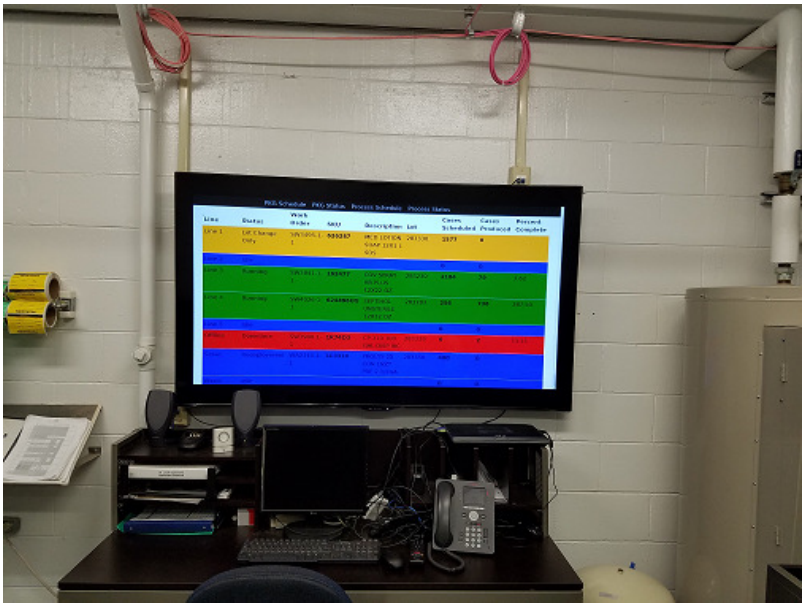
The line scoreboards display the current state of each line and progress against the current schedule.



Packaging Line Scoreboard



The supervisor scoreboard displays the current state of each line and progress against the current schedule.



Supervisor Scoreboard

The supervisor scoreboard also displays the current production schedules for each line.

PKG Schedule PKG Status Process Schedule Process Status

Line	01/03/2017	01/04/2017	01/05/2017	01/06/2017	01/07/2017	01/08/2017	01/09/201
Line1							
Line2							
Line3							
Line4							
Line5							
Serac							
Wand							

The Schedule Board

As changes are made to the production schedule in the existing ERP system; changes also appear on the schedule scoreboard in the supervisor's office in only a few minutes.

Zagros Engineering

The implementation of a Manufacturing Execution System (MES) saved our client time and money. Collecting the data our client is concerned about and providing data where and when they need it allows our client to take proactive measures and spend less time on data collection.

Zagros Engineering offers a wide range of manufacturing system integration services. We specialize in providing accurate data to people that need it, when they need it. We customize MES Systems to answer the individual needs of each manufacturer. Our services range from building the servers to providing specialized reports with the accumulated data.

Our Manufacturing Execution System (MES) team specializes in the following areas:

- Recipe Management
- Performance Analysis (OEE)
- Data Historians
- Reporting Systems
- ERP(Enterprise Resource Planning) Integration

Please visit zagroseng.com for more information or call Jamar Neal at (314)703-1321.