

The GMSG Collaborative Model for Developing Mining Indicators

University of Alberta Learning Seminar 17
October 7, 2014



Data Access and Usage Working Group

The group's main purpose is to identify and document data requirements needed for management and operation of the mine, and communicate those requirements to OEMs and the other working groups in the MSGG to ensure connectivity standards enable unencumbered access to required data.

- Identify On-Board data needs
- Identify data needed by the operation
- Develop a common terminology and definitions across industry,
- Development of standard definitions for Production Data and Operational KPIs;
- Identify OTM /Third party data requirements



Drivers for Development of Common Definitions

- Integration of Technology needs integration of Information
- Start point for identification of data requirements
- Operations looking for Metrics
- Benchmarking
- Technology as Enabler, and as Driver
 - Enabled easier access to more accurate, precise information
- Common terminology



Our Perceptions
Influence our Reality



Background

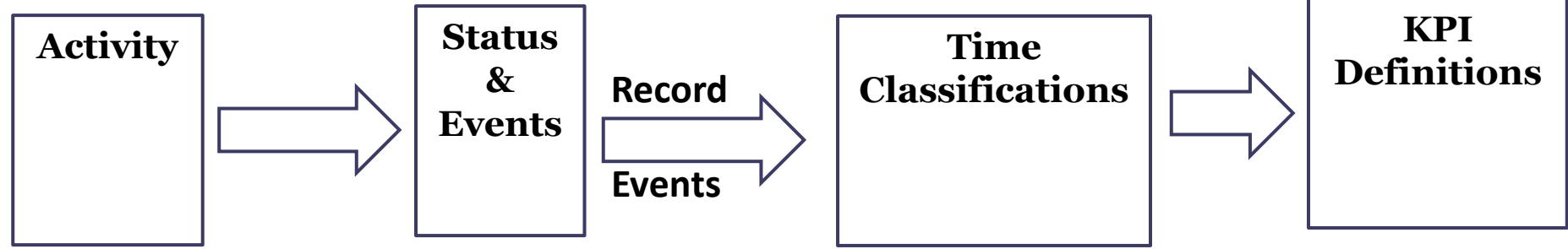
- Standards for Availability & Utilization Study conducted for SMART 2000

Proposed SMART Generic Time Classification Chart - 2000

Time Classification									
Calendar Hours (8760)									
Scheduled Hours								Scheduled Outages	
Available Hours							Down Hours		
Gross Operating Hours						Idle Hours			
Net Operating Hours					Delay Hours				



KPI Logic

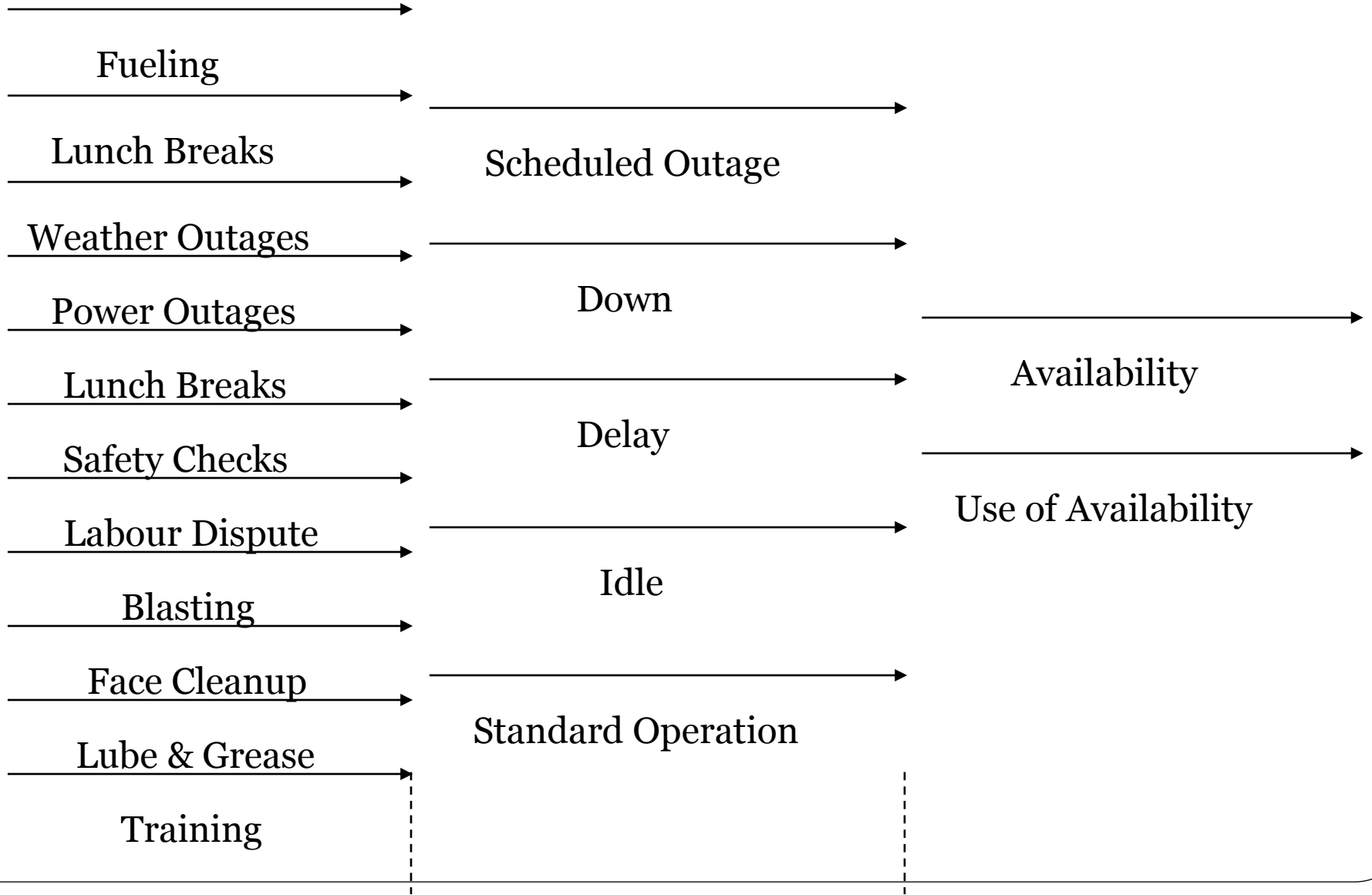




EVENTS

CLASSIFICATIONS

DEFINITIONS





Sample of Activity Listing - Mining

Drilling

Blasting

Tramming

Excavation

Loading

Hauling

Wait (Queue)

Spotting

Dumping

Placement

Compaction

Dozing

Pushing

Ripping

Grading

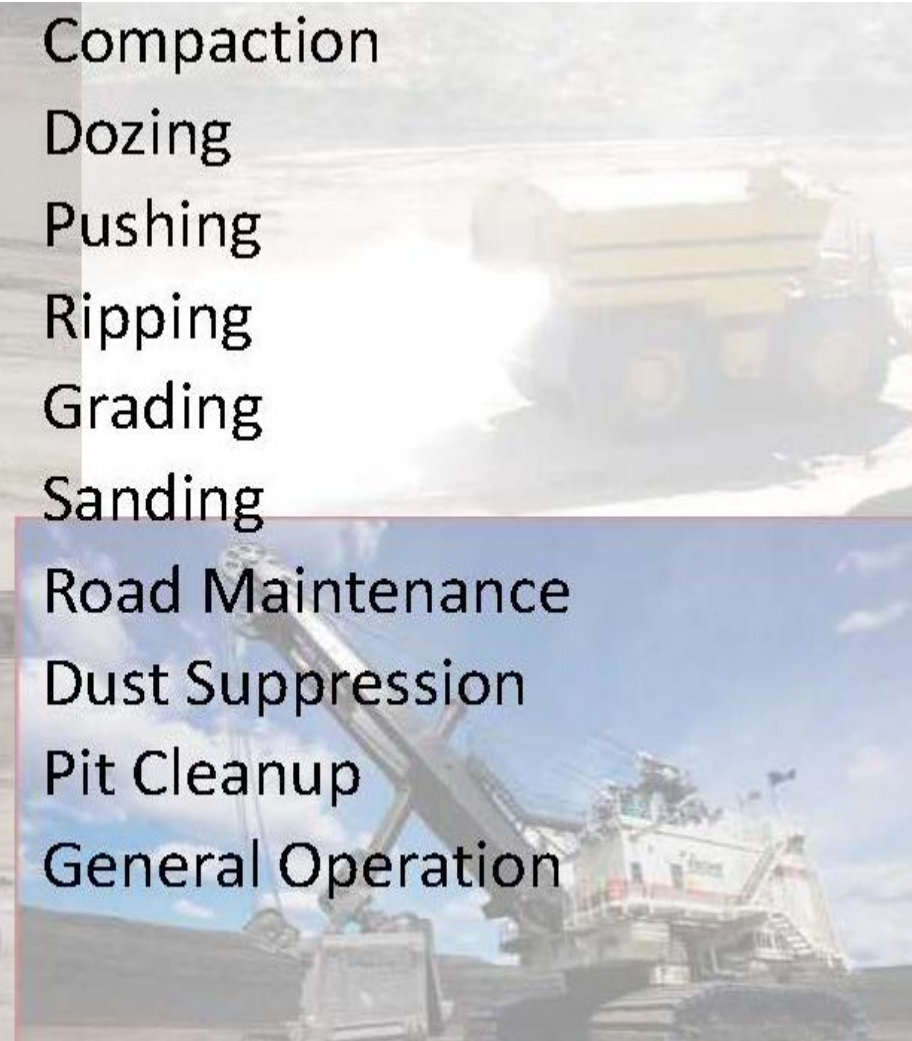
Sanding

Road Maintenance

Dust Suppression

Pit Cleanup

General Operation





Non – Scheduled Events

- No Work
- Statutory Holiday
- Planned Shutdown
- Scheduled Downshift
- Labour Dispute
- Acts of God
- Major Weather Outages

Operating Events

- Spot at LU
- Wait / Queue at LU
- Wait / Queue at Dump
- Return/ Empty
- Truck Packing (On dump/dyke)
- Waiting
- Face Prep
- Salvage
- Disposal
- Placement

Operating Standby Events

- Shift Change
- Safety meeting
- Crew meeting
- Training meetings
- Stop work - Safety
- Stop work - Environmental
- Safety/ Incident Investigation
- Public Relations
- Late Crew Arrival
- Site wide weather outage
- Standby - Not required
- No operator

Operating Delay Events

- Equipment Checks
- Lunch/Coffee
- Personal
- Fueling
- Lube and Grease
- Weather Delay
- Power Outages
- Brake Tests

- Face Cleanup
- Blasting
- Cable Move
- Operator Awaiting Instructions
- Equipment Moves
- Truck Queue
- Roadwork Delay

- Tire Temperature/Pressure Checks
- Tire Cooling
- Change Operator
- Box/ Bucket Cleaning
- Shovel Waiting for Trucks
- Stuck
- Incident



Current Proposed Standard Time Model

Calendar Time = Total Time								
Scheduled Time /Required Time							Unscheduled	
Available Time						Scheduled Maintenance	Break - in Maintenance	
Operating Time (GOH)					Operating Standby	Idle		
Working Time (WOH)				Operating Delay				
Primary Productive (NOH)		Non - Productive						
		Utility Work Wait&Queue						
Value Productive	Production Loss							



Secondary Time Categories

Primary Productive							
Dragline	Shovel	Trucks	Loaders	Dozer	Grader	Drills	Other
Spot	Spot	Spot	Fill	Push		Drill	Ditching
Fill	Fill	Load	Load				Excavation
Swing	Swing	Haul	Spot				
Dump	Dump	Dump	Dump				
Return	Return	Return	Tram				
		Wait					
Non-Productive Utility Work							
Dragline	Shovel	Trucks	Loaders	Dozer	Grader	Drills	Other
Rehandle	Face Prep	Compaction	Cleanup	Rip	Road Grading	Position	Roads - Sanding
Pad Prep	Bucket Cleaning		Tramming	Pit Floor Cleanup	Pit Floor Cleanup	Move	Roads- Dust Suppression
	Cable Move					Redrill	Dewatering
	Shovel Move					Clean	Pit Cleanup
							Clearing
							Grubbing
Non-Productive Wait & Queue							
Dragline	Shovel	Trucks	Loaders	Dozer	Grader	Drills	Other
	Wait Trucks	Wait @ LU	Wait Trucks				
		Wait @ Waste Dump					
		Wait @ Ore Dump					
Operating Delay							
Dragline	Shovel	Trucks	Loaders	Dozer	Grader	Drills	Other
Blasting	Blasting	Fuel & Lube	Fuel & Lube	Fuel & Lube	Fuel & Lube		
Personal Break	Personal Break	Blasting	Blasting	Blasting	Blasting	Blasting	
Weather (Define)	Weather (Define)	Personal Break	Personal Break	Personal Break	Personal Break	Personal Break	Personal Break
Incident	Weather (Define)	Weather (Define)	Weather (Define)	Weather (Define)	Weather (Define)	Weather (Define)	Weather (Define)
Incident	Incident	Incident	Incident	Incident	Incident	Incident	Incident
Stuck	Incident	Incident	Incident	Incident	Incident	Incident	Incident
Power Loss (In Pit)	Stuck	Stuck	Stuck	Stuck	Stuck	Stuck	Stuck
Change Operator	Power Loss (In Pit)	Power Loss (In Pit)	Power Loss (In Pit)	Power Loss (In Pit)	Power Loss (In Pit)	Power Loss (In Pit)	Power Loss (In Pit)
Boarding Machine / Receiving Instruction	Change Operator	Change Operator	Change Operator	Change Operator	Change Operator	Change Operator	Change Operator
Change Operator	Change Operator	Change Operator	Change Operator	Change Operator	Change Operator	Change Operator	Change Operator
Wait for Cleanup	Change Operator	Change Operator	Change Operator	Change Operator	Change Operator	Change Operator	Change Operator
	Wait for Cleanup	Wait for Cleanup	Wait for Cleanup	Wait for Cleanup	Wait for Cleanup	Wait for Cleanup	Wait for Pad Cleanup
		Shovel Move					
		Cable Move					
		Wait for Assignment					
		Box Cleaning					
		Pit Cleanup					
		Road Cleanup					

For Discussion Only



Mine Equipment Performance KPIs

Pure Utilization	Time the asset is being operated as a percent of total time available (Calendar)	GOH / Calendar
Operating Utilization	Time the asset is being operated when scheduled / Required / able to operate	Operating Time / Calendar Time GOH/ Scheduled Time
Effective Utilization	Time Asset is efficiently utilized to intended function	Primary Productive / Calendar Time NOH / Calendar Time
Use of Availability	Time the Asset is manned / Operating as a percentage of Available Time	(GOH) / (GOH + Standby)
Physical Availability	Equipment is Physically Available to perform when needed by the operation	(Scheduled - Down)/Scheduled or Available/Scheduled
Mechanical Availability	Time the equipment is available as a percentage of time required (Manned) by the operation	GOH / (GOH + Down)
Uptime	Total time a unit is mechanically capable of operating, whether scheduled or not	Available Time / Calendar(Total) Time
Operating Efficiency	Operating time as a percentage of time equipment is manned.	WOH/GOH

For Discussion Only

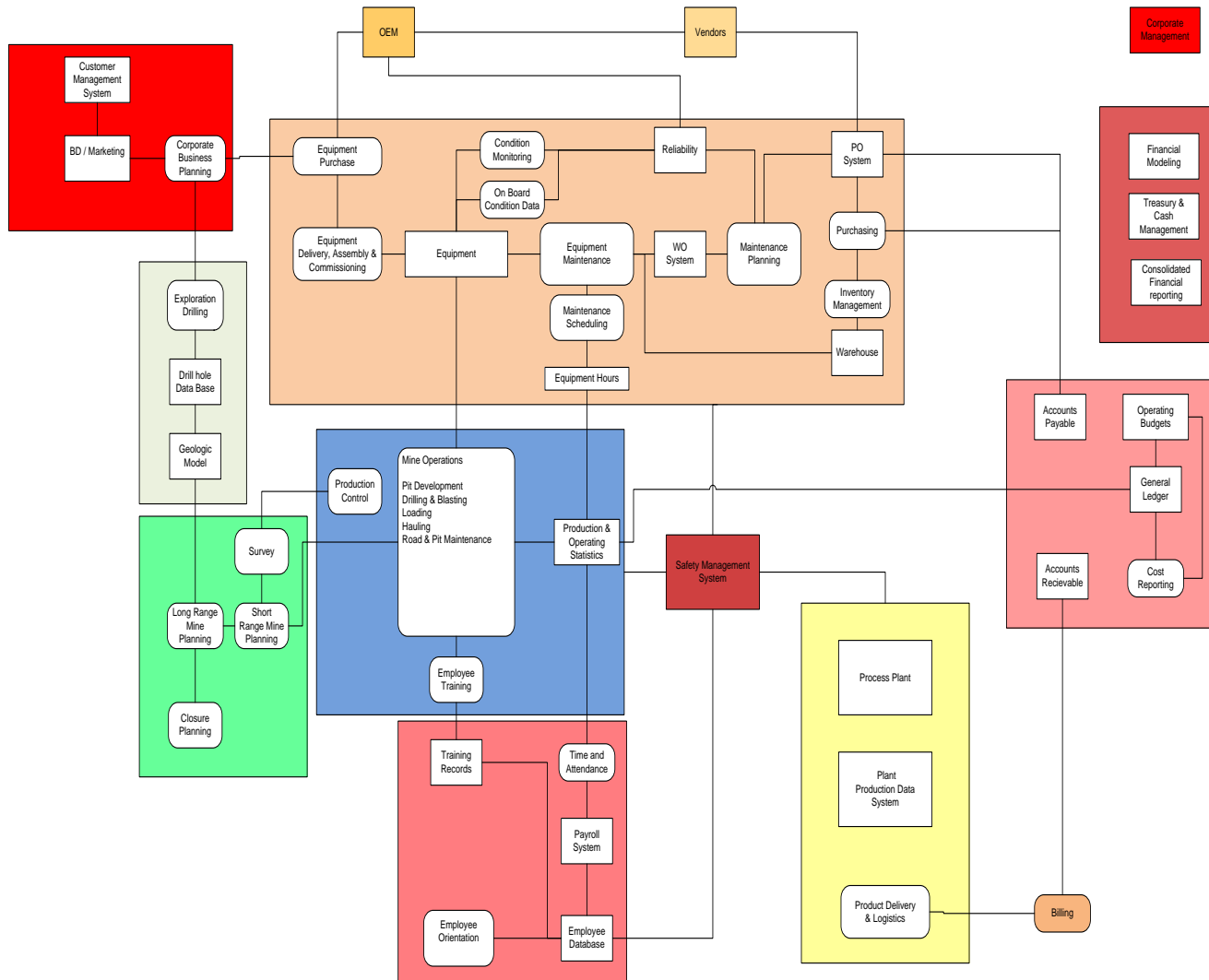


Next Steps

- Discussion paper
- Validate Time Classification Model
 - Focus Groups?
 - Survey?
- Develop common Dictionary of Terminology
- Develop Generic Mining Model



Generic Mining Model



Maintenance & Reliability

- Interest in Maintenance & Reliability Metrics
- How do you measure Reliability?
- What is the Role of Reliability in mining?
- Identify existing metrics / definitions (USW, SMRP, IAM, ISO)
- Identify Maintenance and Reliability data required to support
- Establish Community for Reliability in Mining