



OPERATIONAL KPIs AND DEFINITIONS

WORKING GROUP: DATA ACCESS AND USAGE

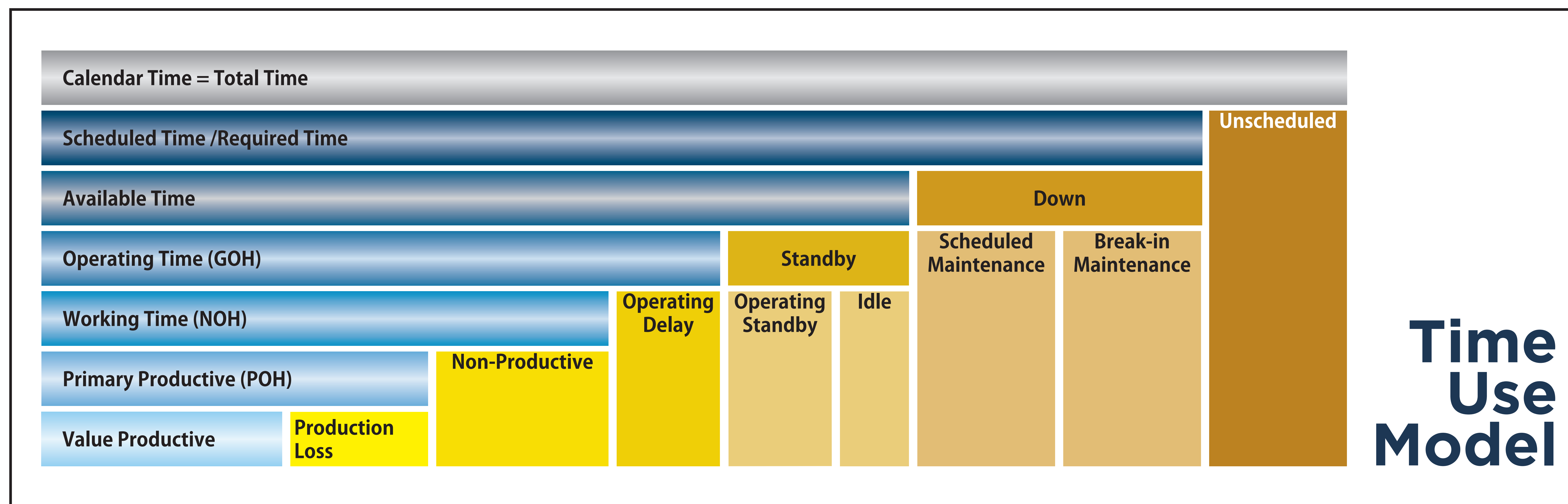
The Guideline will identify events statuses and activities common to surface mining operations, provide guidelines for classification of activities into the Time Categories which make up the Time Usage Model, which in turn forms the basis for common operational KPIs.

PARTICIPATING COMPANIES

3D-P, ACCENTURE, ANGLO AMERICAN, ANGLOGOLD ASHANTI, AVEVA, BARRICK GOLD, BHP, CANADIAN NATURAL RESOURCES, CENTRIC MINING SYSTEMS, CHECKMARK CONSULTING, DASSAULT SYSTÈMES, DATA MINE SOFTWARE, DESWIK, FLOW PARTNERS, FREEPORT-MCMORAN, GIBRALTAR MINE, GLOBAL IO, HEXAGON MINING, IBM, JVA, MINERA YANACOCHA, NEWMONT, OSISOFT, PEABODY ENERGY, PT UKU TECH INDONESIA, RIO TINTO, SIBANYE-STILLWATER, SIEMENS, SMART SYSTEMS GROUP, SSR MINING, SYMBIOTIC INNOVATIONS, TECK, THE ELECTRUM GROUP, TRIMBLE, UNIVERSITY OF SAO PAULO

NEXT STEPS

- Underground Mining
- Processing
- Development of Additional KPIs



Time Use Model

This project will provide industry with common terminology and definitions for production data reporting and KPIs that will enable consistent reporting and classification of activities.

Common definitions will make internal and external performance comparisons more meaningful, allowing comparative analysis and benchmarking with industry peers, resulting in identification and sharing of best practices, raising the bar on overall industry performance.

Work to date has resulted in development of a consensus based Time Usage Model (TUM), based on identification of common surface mining activities, events and delays, classified into common time categories.

The TUM contributes to improved operational performance by allowing operators to identify and record operating delays and losses, and eliminate non-productive activity from their operations.

Primary Time Categories

Time Category Description	Definition / Description
Calendar Time	Total Time Available
Scheduled Time	Equipment is required to meet business plan objectives and scheduled and assigned to a project or job
Unscheduled Time	Equipment is not scheduled or assigned due to external events out of management control, such as labor disruption, lack of market for product, force majeure or Acts of God, including major weather events extending beyond a scheduled operating shift. A planned shutdown would be in this category if shutdown was for inventory control purposes. Equipment assembly, mobilization, demobilization and commissioning would fall into this category. In the case of a contractor this would represent time no work exists. Equipment in this category cannot be readily put into service.
Available Time	Equipment is capable of running and performing its intended function
Down	Equipment is not capable of running or performing its intended function.
Scheduled Maintenance Time	Equipment is not available for operation due to scheduled maintenance. Scheduled maintenance is considered any work identified on a weekly maintenance schedule.
Break-in Maintenance Time	Equipment is not available for operation due to any unscheduled maintenance, which is not reflected in the weekly maintenance schedule, including breakdown, planned but unscheduled preventive or corrective work or inspection. Scheduled maintenance which exceeds scheduled time becomes break-in time.
Operating Time	Equipment is available, scheduled and an operator assigned (on board) and running (collecting meter hours); This is often referred to as Gross Operating Hours (GOH)
Standby	Sum of Operating Standby and Idle. If Idle not used, Operating Standby becomes Standby
Operating Standby	Equipment is scheduled and available but not assigned to an operator for reasons within management control, not related to operating conditions or environment; (meetings, workforce shortage)
Idle Time	Equipment is available, assigned to a project or site, but cannot be assigned for an extended period for reasons temporarily out of operational management control. (Shovel out of digging; drill waiting for drill area, workforce shortage). This would apply to a contractor, where client requests equipment to be shut down due to temporary lack of work, safety stand down, investigation, but requests the equipment be available for work when needed.
Operating Delay	Equipment is manned, and running but stopped or prevented from performing work due to delays inherent to the operation, or immediate physical and environmental conditions. Includes excessive Wait Time.
Working Time	Equipment is operating as assigned, performing its intended function and activities. May also be referred to as Net Operating Hours (NOH)
Non-Productive	Equipment operating at intended function (i.e. Shovel Loading Trucks) but performing work that is not directly contributing to production, required to ensure continued safe and efficient operation such as face clean up, moving trailing cable and other utility work. Incorporates minor wait delays, including shovel waiting for trucks, or trucks queuing at shovel.
Primary Productive	Equipment Operating, performing its primary intended function

Key Performance Indicators

Time the asset is being operated as a percent of total time available (Calendar)	GOH / Calendar
Time the asset is being operated when scheduled / Required / able to operate	GOH/ Scheduled Time
Time Asset is efficiently utilized to intended function	NOH / Scheduled
Time the Asset is manned / Operating as a percentage of Available Time	(GOH) / (GOH + Standby+ Idle)
Equipment is Physically Available to perform when needed by the operation	(Scheduled - Down)/Scheduled or Available/Scheduled
Time the equipment is available as a percentage of time required (manned) by the operation	GOH / (GOH + Down)
Total time a unit is mechanically capable of operating, whether scheduled or not	Available Time / Calendar(Total) Time
Operating time as a percentage of time equipment is manned	NOH/GOH