



## THE PI SYSTEM MAKES DATA SHINE FOR ANGLO AMERICAN PLATINUM

*From running our cars' exhaust systems to beautifying our jewelry collections, platinum is a highly prized material, and the process of refining it is highly involved. Anglo American Platinum, the world's leader in refined platinum, produces around 37% of this precious metal. Unfortunately, platinum extraction provides very small yields. Out of the 29.7 million tons of rock Anglo American Platinum mined in 2017, the company extracted only 78 tons of platinum. Each piece of platinum is smaller than a speck of dust – some are as small as 5 microns – so efficiency in the refinery process is crucial.*

*To keep all Anglo American Platinum's equipment up and running and maintain ingot quality assurance, the company collected operations data manually, which required many man-hours to extract from spreadsheets. After putting together a list of requirements for a new data platform, the company opted to unroll the PI System™ as their digital transformation solution.*

### THE COMPLEX DANCE OF RESOURCE MANAGEMENT

Creating high-purity platinum ingots requires a slow cooling of the metal in gigantic concrete molds, taking several days and multiple steps. "You want to know where [the ingots] are in the process," said Warren Armstrong, a Control Technology Specialist for Anglo American Platinum during PI World Barcelona 2018. "If you've cast too many, you don't have any molds available, and production would potentially stop because you've got to wait for those to go through."

Tracking the ingots in real time was vital for engineers who needed to know the answers to critical equipment life cycle questions: How many ingots were casted into a specific mold? How many ingots must be pulled from molds on a given day? How many molds are available for casting? What is the average mold fill?

On top of that, all the company's equipment, from the molds to the ladles used in ingot casting, require regular maintenance and eventually replacement. Managing these assets is a high-stakes endeavor: "If you mess up in this area," said Armstrong, "you've actually messed up the entire process line for the company."

### CHALLENGE

Create a platform to access up-to-date ingot and equipment life-cycle information to eliminate a manual process based on spreadsheets.

### SOLUTION

The PI System gave Anglo American Platinum visibility into their manual process, allowing them to track each step of production.

### BENEFIT

By capturing critical process events, the company saved around 400 hours of additional development time.

Using the PI System with Event Frames, Anglo American Platinum can now track the status of its ingots, ladles and casting molds in real time.

**Mould View**

Date: 2018 Jan 11 - Thu 12 PM

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**Moulds**

101	14,94	701	19	1301	17,96	1901	8,72	2501	12,86	3101	
102	18,42	702		1302	18,44	1902	12,68	2502	13,16	3102	
103	12,96	703	18,4	1303		1903	12,96	2503	12	3103	
201	13,38	801	17,05	1401		2001	15,36	2601		3201	18,5
202	16,14	802	16,4	1402	15	2002	20,5	2602	11,6	3202	
203		803		1403		2003	15	2603	17,7	3203	9,2
301		901		1501	14,7	2101	15,34	2701	11,2	3301	16
302		902		1502	16,2	2102	17,02	2702	4	3302	20
303	none	903		1503	16	2103	17,72	2703	20	3303	
401		1001	14,86	1601	11,1	2201		2801	22,7	3401	16,62
402	13	1002	14,91	1602		2202		2802	12,1	3402	11
403	14	1003		1603	12,1	2203	38	2803	14	3403	10
501	18	1101	8	1701	20	2301	9,9	2901	20	3501	
502	16	1102	17	1702	12,7	2302	15	2902		3502	
503	15,3	1103		1703		2303	16,9	2903	18,42	3503	
601	11	1201	14	1801	17,5	2401	16	3001	19,6	3601	
602	15	1202		1802	18,76	2402	13,51	3002		3602	15,92
603	14	1203	13	1803	8,7	2403	14,4	3003	16,14	3603	17,02

**Summaries**

Image	Name	Count
✓	Mould Ok	103
✓	Mould available	29
✓	Mould in use	77
✗	Mould damaged	0
✗	Mould on maintenance	0
✗	Mould to cure	0
✗	Mould burner on	0
✗	Mould burner tripped	1

Image	Name	Count	Weight
✓	Ingot in mould with lid on	76	1154,91
✓	Ingot in mould - cooling	1	18,76
Σ	<b>Total</b>	<b>78</b>	<b>1173,67</b>

Image	Name	Count	Weight
✓	Lids to Lift	75	1116,91
✓	Ingot to Pull	2	56,76
✗	Broken\ no hangers	0	0,00
✗	Revert	0	0,00
Σ	<b>Total</b>	<b>77</b>	<b>1173,67</b>

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Unfortunately, analyzing equipment performance and life cycle wasn't simple, especially when cross-month comparisons were needed. Armstrong described a familiar situation to many industries: their Excel-based system worked, but "if you wanted to actually find performance metrics... someone would have to dig through multiple Excel sheets and collate the data [manually]." Real-time equipment and ingot statuses were out of the question. The team needed to find a way to have that information at their fingertips sustainably and integrate that solution with their existing data storage and user needs.

### A CUSTOMIZABLE SOLUTION OFF THE SHELF

The PI System, in conjunction with [Asset Framework](#) (AF), a data contextualization layer of the PI Server, was a perfect fit. Engineers used AF to create a data hierarchy to structure and contextualize the data from ingots and equipment. With AF acting as a digital twin for the plant, the team set up [Event Frames](#) to capture critical process events – from casting and cooling to lid removal and crushing. Engineers gave each life cycle event a start and end time associated with specific equipment to get real-time information about the ingots, ladles, and molds. They used Event Frame templates, which were easy to set up and replicate and had all the necessary calculations built in. "It was almost a no brainer to let the Event Frames and Asset Framework do the heavy lifting," said Armstrong. "All the end user needs to do is actually enter

data." Now the team can pull a wide variety of useful searches out of the PI System, from finding out which ingots need to be removed from molds to chemical information on the contents of each ladle.

### EVENT FRAMES SAVE TIME AND MONEY

The new system was a tremendous success. For the first time, Anglo American Platinum was able to get live information into its manual process, and dramatically reduce the time required for manual data entry. Using existing tools meant less to implement and less to maintain. "Utilizing existing functionality, we estimated we conserved about 400 hours of development time, because we didn't have to rebuild... you could just utilize it and build the front end on top of it," explained Armstrong. The PI System kept all the data in one place, which allowed users to easily access the information required for critical insights.

Today, the PI System is an integral part of Anglo American Platinum' overall process, from recording furnace pressure events to tracking the efficiency of their trucks. Over the past few years, Anglo American Platinum has generated over 6 million Event Frames. They are now looking to upgrade their architecture and visualization tools, as the PI Web API and other functionality were not available five years ago when they first began to implement their Asset Framework solution.

*For more information about Anglo American Platinum and the PI System, watch the full presentation [here](#).*



OSIsoft's Event Frames is a perfect fit. They have start and end times. They are based on templates... You can have a whole genealogy... of a piece of an equipment or phases of a life of a product."

— Warren Armstrong, Control Technology Specialist at Anglo American Platinum

Armstrong, Warren. "A Novel Approach At Anglo American Platinum to Enable Life Cycle Management" <<https://www.osisoft.com/Presentations/Event-Frames-%E2%80%93-A-Novel-Approach-At-Anglo-American-Platinum-to-Enable-Life-Cycle-Management/>>