

# SINGLE POINT LESSON: CALCULATING ASSET UTILIZATION

From RELIABILITY EXCELLENCE FOR MANAGERS Course



## What is it?

Asset Utilization (AU) is the true measure of how well you are using your installed capacity. Unlike Overall Equipment Effectiveness (OEE), it accounts for all losses, not just those directly associated with the production or manufacturing process.

## Why use it?

Gaining or maintaining a competitive edge depends on the ability to effectively utilize installed capacity. Failure to sustain utilization rates of 70% or better drives up unit cost and makes it very difficult to achieve or sustain a competitive position.

OEE measures only those losses directly associated with the effectiveness of the production or manufacturing operation. The denominator for OEE is "planned" production time, which is typically between 5,000 and 6,000 hours per year. It does not consider the cost and losses attributed to overall use of the capital asset investment and under-utilization of installed capacity. To fully understand the effectiveness of your organization you must use both OEE and AU.

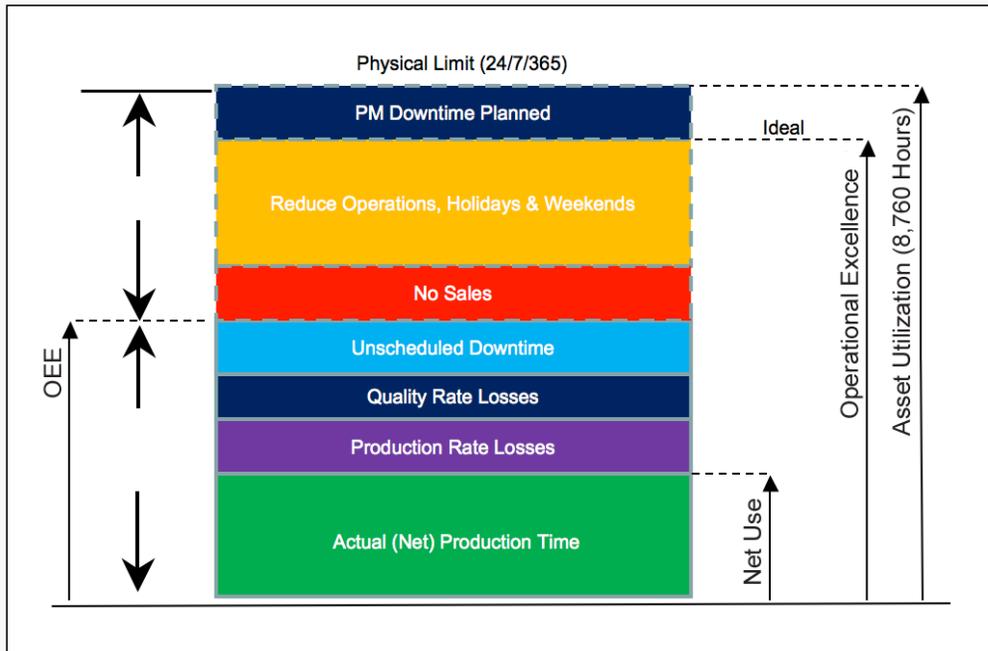
## What factors are critical for success?

Factual, timely data is essential and must include:

- Time required for sustaining maintenance. Depending on industry, between 5% and 11% of the calendar year is required for maintenance. This does not include maintenance tasks that can be performed on-site.
- A lack of sales is a major reason for capacity or utilization losses. To be effective, analysis of AU must verify and validate the reasons behind this loss classification. One should always remember that "no sales" is controllable and every effort is required to increase sales.
- Accurately quantify logic and losses associated with:
  - Mode of operations, e.g. shifts/day days/week, holidays and outages
  - Speed and output targets
  - Staffing and overtime policies
- Except in leap years, always use 8,760 (24/7/365) as the denominator for AU calculations.

## How do you do it?

Determining current state of capacity or asset utilization is both simple and complex. Illustrating the current state and associated losses is straightforward, but obtaining accurate data can be very challenging. The following steps will lead to an accurate map of capacity utilization.



**Step 1:** Determine the actual annual downtime for planned maintenance for all production and manufacturing systems. Calculate the average for your plant and record the result.

**Step 2:** Determine the lost time associated with the mode of operation. These losses include:

- Reduced operating hours: If your plant or any of its major assets operate less than 24/7/365, calculate the lost hours associated with the non-operating time.
- Holidays: If all or part of your operation shuts down for holiday, calculate the lost production hours that result.
- Outages: If your plant shuts down for maintenance, plant vacations, seasonal demand or other reasons, calculate the lost production hours associated with this downtime.

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**Step 3:** Calculate lost production hours caused by “no sales” or backlog. This should include:

- Seasonal demand that results in variable operating hours or periodic operations
- Loss of market share
- Production plan or schedule
- Changeovers, innovations, trials, and other business-driven downtime

**Step 4:** Total the losses in the preceding steps. The result is the total losses that are directly attributable to the company’s strategic plan. These asset utilization losses are outside the control of the operations or production function and must be corrected by executive management.

**Step 5:** (This step is the initial measurement of OEE and is the first loss that is within the control of the operations function.)

Determine the losses associated with unscheduled downtime. Historical data should be used to determine the statistical probability of these losses and should then be carefully measured as the current production year continues. Unscheduled downtime losses should include and carefully track:

- Breakdowns caused by operations and maintenance deficiencies
- Variations in downtime required for changeovers, innovations, trials, etc. The standard time is captured in “no sales” losses. Only time in excess of standard should be charged here.

**Step 6:** Calculate quality losses. Quality losses are not actual lost production hours, but one must de-rate true hours because of the lost volume. The result of this calculation defines the actual units lost as equivalent operating time.

**Step 7:** Calculate production rate losses. As in the case of step 6, these losses are in volume and typically result for operating production or manufacturing assets below their design or best demonstrated speeds. For example, operating a packaging machine at 5,000 units/minute in lieu of its 10,000 units/minute rating results in a 50% reduction in output and would therefore be equal to reducing the operating time by 50%.

**Step 8:** Determine actual asset utilization. Complete the utilization model by inserting all of the losses in their appropriate blocks. Subtract all losses from 8,760—the total number of hours in a 24/7/365 year. The resultant is your true capacity utilization.

