# Brake jet calculation

Guaranteed value = 12 min

# Sketch

# Motivation
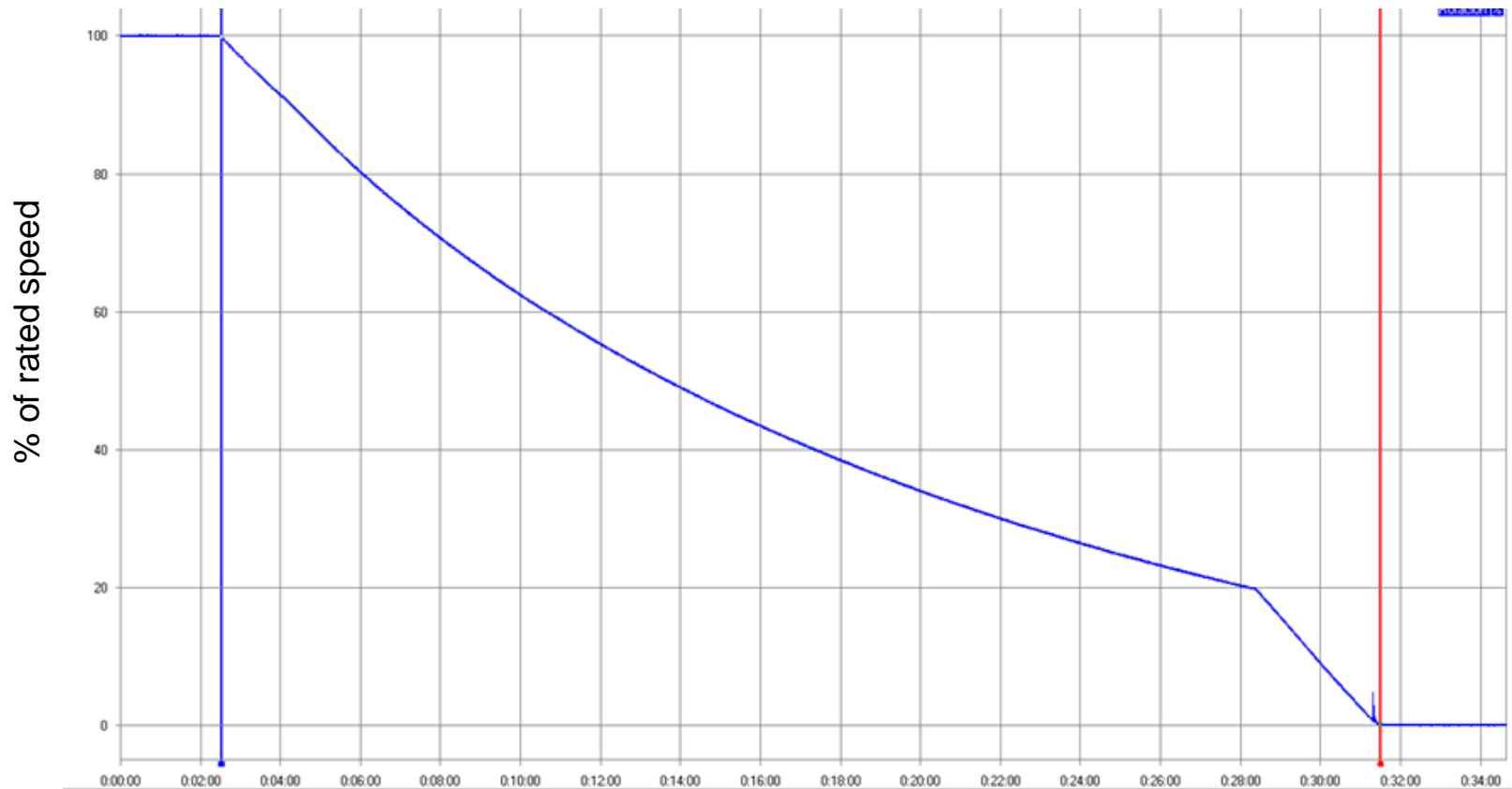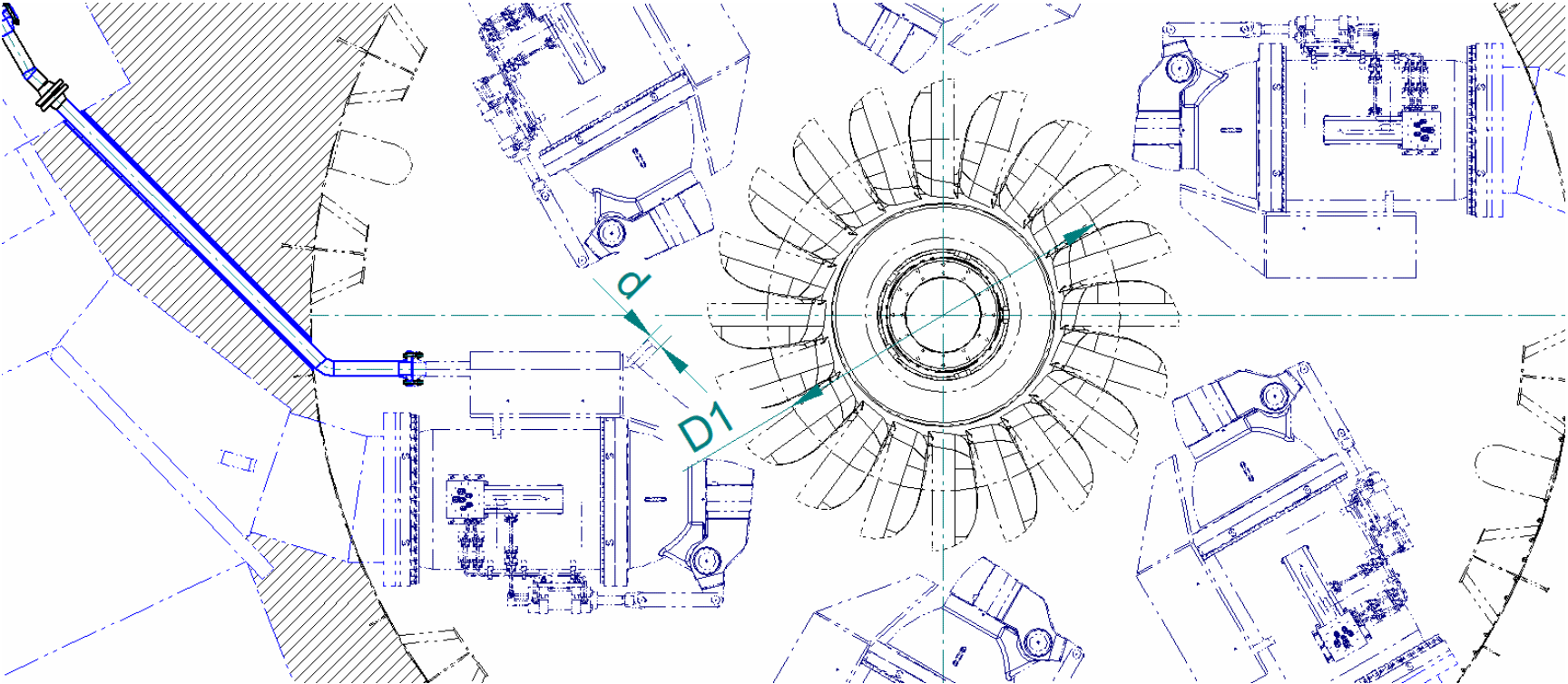
Understand the assumptions of the following equation used to determine the diameter of the brake jet ($d$) in [m].

$$d = \frac{10^{-2}}{\sqrt{z_d}} \sqrt{\frac{0.011 \times GD^2 \times n \times 0.85}{\left(0.189H + 0.00109\sqrt{H}D_1 n\right)D_1 t_f}}$$

Where:

$z_d$ is the number of brake jets [-], $GD^2$ is $4 \times$ the rotating parts moment of inertia ($J$) [kg.m$^2$],

$n$ is the rotational speed which the brake jet is activated [rpm],

$H$ is the head available for the brake jet [mWC],

$D_1$ the runner bucket center diameter [m],

$t_f$ is the time required to stop the rotating parts after the brake jet is activated [s].

# Development
## Deceleration of rotating parts

For more details see:  Angular momentum - Wikipedia

## Torque due to the brake jet

For more details see: <u>Pelton wheel - Wikipedia</u>