

OPTION CHECKLIST NO. 3: PUMPS & PUMPING SYSTEMS

<ul style="list-style-type: none"> • Operate pumps near best efficiency point (BEP).
<ul style="list-style-type: none"> • Ensure adequate NPSH at site of installation.
<ul style="list-style-type: none"> • Modify pumping system and pumps losses to minimize throttling.
<ul style="list-style-type: none"> • Ensure availability of basic instruments at pumps like pressure gauges, flow meters.
<ul style="list-style-type: none"> • Adapt to wide load variation with variable speed drives or sequenced control of multiple units.
<ul style="list-style-type: none"> • Stop running multiple pumps - add an auto-start for an on-line spare or add a booster pump in the problem area.
<ul style="list-style-type: none"> • Use booster pumps for small loads requiring higher pressures.
<ul style="list-style-type: none"> • Increase fluid temperature differentials to reduce pumping rates in case of heat exchangers.
<ul style="list-style-type: none"> • Repair seals and packing to minimize water loss by dripping.
<ul style="list-style-type: none"> • Balance the system to minimize flows and reduce pump power requirements.
<ul style="list-style-type: none"> • Avoid pumping head with a free-fall return (gravity); Use siphon effect to advantage.
<ul style="list-style-type: none"> • Conduct water balance to minimise water consumption, thus optimum pump operation.
<ul style="list-style-type: none"> • Avoid cooling water re-circulation in DG sets, air compressors, refrigeration systems, cooling towers feed water pumps, condenser pumps and process pumps.
<ul style="list-style-type: none"> • In multiple pump operations, carefully combine the operation of pumps to avoid throttling.
<ul style="list-style-type: none"> • Provide booster pump for few areas of higher head.
<ul style="list-style-type: none"> • Replace old pumps by energy efficient pumps.
<ul style="list-style-type: none"> • In the case of over designed pump, provide variable speed drive, or downsize / replace impeller or replace with correct sized pump for efficient operation.
<ul style="list-style-type: none"> • Optimise number of stages in multi-stage pump in case of head margins.
<ul style="list-style-type: none"> • Reduce system resistance by pressure drop assessment and pipe size optimization.
<ul style="list-style-type: none"> • Regularly check for vibration trend to predict any incipient failures like bearing damage, misalignments, unbalance, foundation looseness etc.