Alarm configuration
The decision to configure an alarm must meet the following three criteria:

• The event requires operator attention and action
• The alarm is the best indicator of the situation’s root cause.
• The alarm is truly resulting from an abnormal situation.

SNS vacuum Major Alarm levels

<table>
<thead>
<tr>
<th>Subsystem</th>
<th>Major Alarm Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front End</td>
<td>5x10^-4 to 5x10^-6 Torr</td>
</tr>
<tr>
<td>DTL, CCL, SCL</td>
<td>1x10^-6 Torr</td>
</tr>
<tr>
<td>HEBT, Ring, RTBT</td>
<td>5x10^-6 Torr</td>
</tr>
</tbody>
</table>

The rationalization for an alarm on wiki page

Applied to the vacuum system, we decided to create three types of vacuum alarms:
1) Elevated vacuum pressure:
   Might, for example, indicate a leak in the vacuum vessel.
2) Valve status:
   A valve that is supposed to be open is found closed.
3) Pump status:
   A pump that is supposed to be running is found off.

Along the SNS linac, there are many pressure sensors, valve and pump readbacks. Instead of adding each one individually to the alarm system, we decided to summarize them for 7 areas: Front end, CCL, DTL, SCL, HEBT, Ring, RTBT.

For each area, vacuum system experts can control which of the vacuum sensors are used to compute the alarm and at what level. They can disable alarms from pumps which are temporarily not required, or disable alarms from faulty sensors. In case of a severe vacuum problem, for example, in the DTL, operators receive one “DTL Vacuum Pressure” alarm instead of one alarm from each vacuum sensor in the DTL.

The real alarm PVs are running in VME IOCs, and some of the calculation records used for alarm summaries are running in the Linux soft-IOCs.