Are you customer focused?
User Specified Control System Modifications for the Argonne Tandem LINAC Accelerator System (ATLAS)

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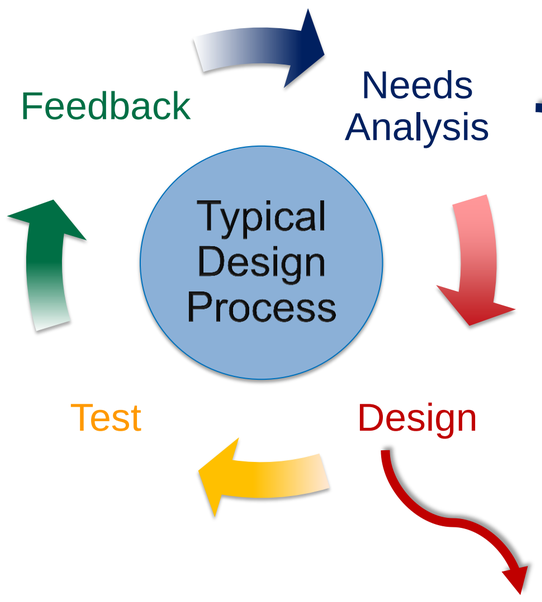
Abstract

Applying customer focused management policies is a key to success in any organization. The primary customer of the control systems group at the ATLAS accelerator is the operations group which provides beam to the experiments. Occasionally, special experiments and beam development projects also have requests and needs that affect the entire control system. The benefits of a customer focus and recent modifications to the ATLAS control system for these groups will be discussed.

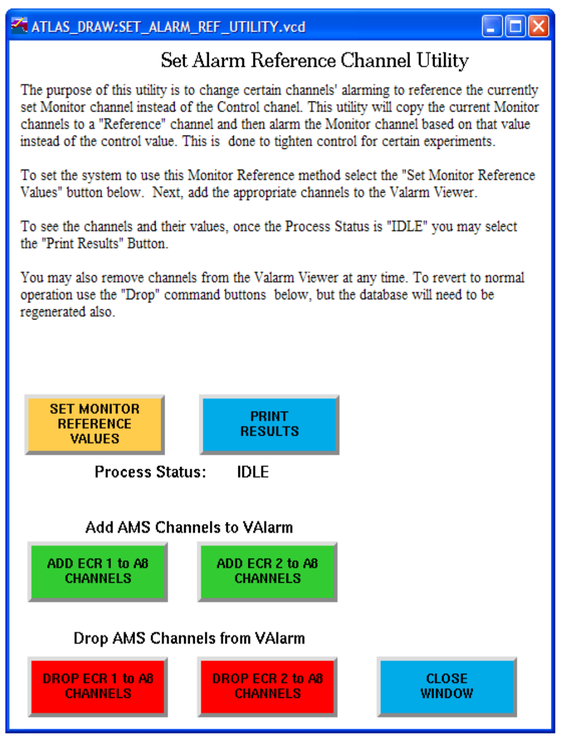


This is a potential general problem for AMS at ATLAS (where it is not always straightforward or even possible to check transmission). I would like to ask you if one could write a rather simple software which would monitor (at some repetition rate to be selected) all elements of the actual beam line and compare it with a nominal setup. If some element deviates from this setup by more than a fixed acceptance window (pre-defined for each element), it would alert the operator.

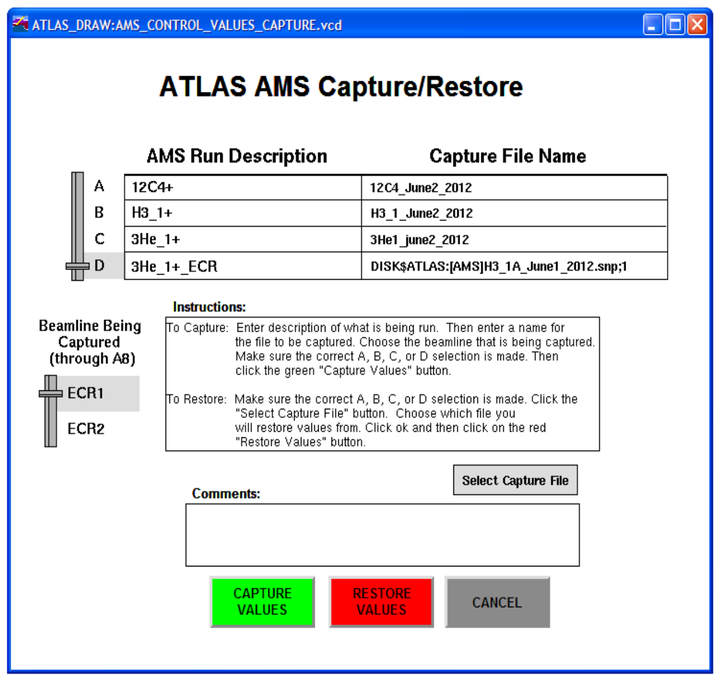
Experimenter's Initial Request

- Monitor ion source and beam guidance elements to ensure stability.
- Save and Load Device settings in order to switch between various states.
- Hold magnets to specific field.
- Set magnetic devices more accurately when loading.

Identified Requirements to meet the Experimenter's Needs

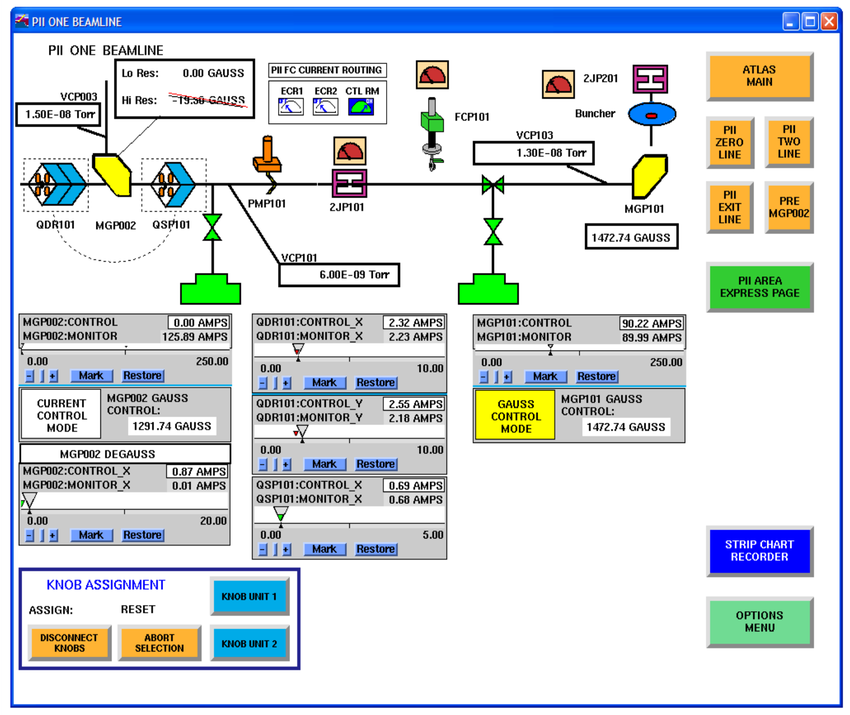


A specialized alarming system places tight alarm parameters on the ion source, magnet field readings, and beam guidance channels. Generally, the devices will alarm outside of 1% of the "correct" value or in the case of the magnets, outside of 2 Gauss difference. The Extraction Voltage monitors are alarmed beyond 1x10-4 of the set value.



The capture/restore utility allows the experimenter/ operator to save up to capture control settings for the beamline and restore them back quickly and accurately. This allows the experimenter to quickly change between multiple elements and charge states.

Magnetic devices are ramped appropriately to ensure equivalent field settings.



Field control mode on all magnets continuously monitors the field value and adjusts the control current to maintain the field within the specified tolerance.

Experiment Results

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A Shorter ^{146}Sm Half-Life Measured and Implications for ^{146}Sm-^{142}Nd Chronology in the Solar System

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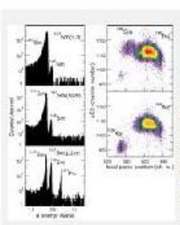

Fig. 1

(Left) α spectra from ^{147}Sm activated via (γ,*n*), (*n*,2*n*) and (*p*,2*n*ε) reactions, determining the ^{146}Sm/^{147}Sm activity ratio; (**right**) identification spectra measured for a (*n*,2*n*)-activated sample (top) and nonactivated ^{nat}Sm (bottom). The spectra display energy loss versus position signals from a detector along the focal plane of a gas-filled magnetic spectrograph. The device separates in position (magnetic rigidity) ^{146}Sm ions from ^{146}Nd isobaric ions (originating from chemical impurities in the sample or in ion source structural material), owing to their different mean ionic charge state in the gas (*25*). The observed $^{126}Xe^{19+}$ group is transmitted by the accelerator because its charge-to-mass ratio is quasi-degenerate with that of $^{146}Sm^{22+}$ and originates from residual gas in the ion source. In order to determine the ^{146}Sm/^{147}Sm ratios (*25*), the count rate in the ^{146}Sm group was normalized to ^{147}Sm, alternately transported through the accelerator (Fig. 2). The blank spectrum shown for the ^{nat}Sm sample (lower right) corresponds to a ratio ^{146}Sm/^{147}Sm < 10^{-11}.

Future – Automate Processes

- Take and save settings
- Load and verify settings
- Energy readings
- Sample changing
- Include target areas (which use separate control systems)