Design requirements for UEWS alarm enable logic

Input: RSDF input every 2 seconds

* First line is HS – this will be used for timestamps
  + First 6 numbers are dd/mm/yy /h/m/s accordingly
* Second line is PP – this will be used for location tracking
  + First 3 numbers are X/y/z coordinates
  + Last 2 numbers are heading (degrees off y-centerline) and knots (used to be total, but now only x/y plane?) These numbers are already averaged before they are sent in. I believe averaged over the past 10 numbers

Output: Alarm enable signal and Transmit Alarm

* Alarm enable goes to control panel
* transmit alarm goes directly to the speakers (separate program?)

Alarm Enable Logic:

Actual Position (act\_P)

Projected position after S seconds (Proj\_P\_G) calculated from given knots and heading

Projected position after S seconds (Proj\_P\_C) calculated from given heading and given position (calculated knots)

* Case 1: Outlier in X,Y,Z, Knots
  + - Needs 5 concurrent occurrences for Position
    - Needs 2 out of 5 occurrences for Projected Position
  + 2500 < x < 15560 yards
  + -220 < y < 2200 yards
  + 25 < z < -600 feet (this is redundant because of case 3…)
  + Knots < 40
* Case 2: Depth according to the 3 boarder zones
  + - Needs 5 concurrent occurrences for Position
    - Needs 2 out of 5 occurrences for Projected Position
  + See border zone diagram
  + Inner boundary: -220 < z <-165
  + Middle Boundary: -165 < z , -75
  + Outer Boundary: -75 < z < 0
* Case 3: No PP Data coming in
  + Set Alarm after R seconds
  + Need to define R

Other requirements?:

* Must take in data every 2 seconds
* Must output alarm enable signal, while still running and calculating
* Must turn off alarm enable signal, while still running and calculating

Random notes:

* Incoming data is in feet
* Boundaries are listed in yards (should probably changes all these to feet if possible (map?)
* Case 4: Projected X/Y Boundary and Depth violation (NEEDS 2 OUT OF 5 OCCURANCES)
  + Projected position after S seconds is out of bounds in case 1 (maybe list this under case 1)
* Case 5: Projected Depth Violation? (NEEDS 2 OUT OF 5 OCCURANCES)
  + Need to define Projection