FMEA (Failure Modes and Effects Analysis)

PES Project 5

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Potential Failure Mode	Potential Failure Effects	SEVERITY (1 - 10)	Potential Causes	OCCURRENCE (1 - 10)	Current Controls	DETECTION (1 - 10)	RPN
In what ways could the step, change or feature go wrong?	What is the impact on the customer if this failure is not prevented or corrected?		What causes the step, change or feature to go wrong? (how could it occur?)		What controls exist that either prevent or detect the failure?		
Rx Buffer Overflow	*Unintentional corruption of data stored in buffer*	*7*	*Buffer reaches its maximum size limit*	*8*	*Reallocating the buffer in case of overflow and dump elements, notify the user if reallocation fails*	*3*	*168*
Receiving characters while reallocating	*Corrupting the buffer contents*	*6*	*ISR trying to save a character into the buffer while the buffer is being reorganised after realloc() operation*	*4*	*Define reallocation and re arrangement as a critical section*	*7*	*168*
Baud Rate Mismatch	*Garbage values will be transferred*	*9*	*Baud Rate Generator Registers not initialised properly*	*3*	*Initialize the UART registers with calculated baud rate values*	*3*	*81*
Reallocation failure	*Potential Loss of previously stored buffer contents*	*8*	*Not enough space on the Heap*	*2*	*Store the buffer pointer before reallocating and restore it, If the realloc() operation returns a NULL pointer and also print the report.*	*5*	*80*
Overwriting contents of the buffer	*Corrupting the current buffer contents*	*5*	*Adding an element to the buffer when it is full or deleting from an empty buffer*	*7*	*Check if the buffer is empty or full before deleting or writing contents of buffer.*	*2*	*70*
Initial Memory Allocation Failure	*Characters input using UART will not be stored*	*10*	*Not enough space on the Heap*	*1*	*Check if the malloc() returns a NULL and notify the user, then terminate the program*	*1*	*10*