Failure Modes and Effects Analysis

Project Name:	PES Project 5 - UART Communications with PC
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Key Process Step or Input	Potential Failure Mode	Potential Failure Effects	SEV	Potential Causes	OCC	Current Controls	DET	RPN	Actions Recommended	Resp.	Actions Taken	SEV	OCC	DET	RPN
Unexpected shutdown of the system	Entered data is lost	User data is lost and causes the program to restart	8	Low battery on the PC or FRDM Board is disconnected unexpectedly	7	Value is stored in non-volatile memory	1	56	Keep the PC at high charge and reduce the risk of disconnection of the board	Gitanjali/Sarayu	Power supply maintained for the board at all times	4	4	2	32
UART Communication failure	User is unable to input values to the circular buffer	Fails to meet the initial requirement of the project to take a character from the user and echo the value	10	UART registers not initialised properly	7	Hard code values to see if the rest of the program works fine	2	140	Check the datasheet for the right values of the registers	Sarayu	Register values are modifed	6	2	4	48
UART prints garbage values	User is unable to see the output on the terminal	Program functioning cannot be determined for debug and other purposes	8	Baud rates are incorrect	6	Keep the baud rate at the terminal window at 56700 and in the program at 115200	6	288	Divide the calculation of sbr further by 2 to match the current baud rate	Sarayu	Change in code to divide the System Clock value by 2	3	8	4	96
Printing of frequency of ASCII Characters gives hard fault	Incorrect report generated	User will be unable to see the right frequency of the values input by him/her	7	The array containing the frequency information has values other than 0 post initialisation	5	Value 0 is hard coded into each element of the array	10	350	Isolate the problem to array initialisation and updation	Gitanjali	Changing the scope of the array	5	5	4	100
Circular buffer reads and writes without memory being allocated	Storage of characters not possible	Values cannot be accessed for report generation	9	No check performed for NULL	5	Check for NULL is performed	8	360	Do not perform read and write operation with the buffer if no memory is allocated	Gitanjali	Sample values are stored and printed to check if buffer is rightly allocated	7	6	3	126
Buffer is filled with same values upon entering one value through UART	Incorrect information is stored	Incorrect information is echoed and reported to the user; fails the purpose of the project	10	Loop condition incorrect	10	Providing values to the buffer without a loop	5	500	Limit the input to the buffer so that the buffer size is not reached	Gitanjali	Looping condition corrected	6	6	4	144