Activity Diagram

Develop a comprehensive activity diagram for below case study. The diagram should clearly depict all activities, decision points, swimlanes for different actors, transitions, and concurrent processes, aligning with the workflow described in the case study provided below. Include annotations for initial and final nodes, forks, joins, and conditions for transitions wherever applicable.

Space Station Life-Support Monitoring

A space station relies on an automated Life-Support Monitoring System to ensure astronaut safety. The Monitoring System continuously monitors oxygen levels, temperature, and pressure. If all parameters are within safe limits, monitoring continues uninterrupted.

When a fault is detected, the system first classifies the fault type as minor, major, or critical.

Minor fault: The system attempts automatic correction. If the correction succeeds, normal monitoring resumes. If the correction fails after a retry, the system escalates the fault to major**.**

Major fault: The system notifies the Crew and attempts to activate backup life-support units. If backup activation fails, the system alerts Mission Control for remote intervention.

Critical fault: The system immediately alerts the Crew, initiates emergency protocols, and triggers two parallel actions the Monitoring System activates backup life-support units, and the Crew performs emergency safety procedures. At the same time, the system performs a secondary task to maintain oxygen redundancy checks.

Once all actions are complete and the system stabilizes, the Monitoring System logs the incident, updates the status of life-support systems, sends a report to Mission Control**,** and resumes normal monitoring. The workflow then terminates, marking the end of the process.

Activity Diagram Evaluation Rubrics (10 Marks)

Criterion	
Understanding of Scenario	2
Initial & Final Nodes	1
Action States	2
Decision & Merge Nodes	2
Fork & Join (Parallelism)	1
Swimlanes / Responsibility Separation	1
UML Notation & Diagram Clarity	1
Total	10 Marks