Review of the Project Group:
Group Code: 22
Full title: ABWR Advanced Boiling Water Reactor

Intended learning outcome (ILO)	Grade (0-3)	Explanation for the grading of the evidences of achieving respective ILO. Suggestions for improvements and other comments
1. *Collect information on* General design specification of the nuclear power plant with selected reactor type (Task 1, ILO1, ILO2)	2	Task 1: In this task there was a general description of the reactor core and reactor vessel with an adequate focus on the unique design focus. There is no mention of the balance of plant components, and this should be added. IL01: Key elements and safety features were introduced, but this would also be a good location to include technical information such as material compositions, numbers of pumps, and specifications of components. L02: The principles of nuclear reactor operation and control should be expanded by including discussion about the balance of plant. There are erroneous references to steam generators.
2. *Describe* Operational principles of the power plant. (Task 2, ILO1, ILO2)	2	Task 2: Reactor operation during start-up is not discussed, but there is some discussion of normal operation and shutdown. Base load and load-following are discussed, but there are not specific details on ramp rates, or how load-following is controlled. There are some statements about controlling reactivity that need more explanation. The discussion on unique features is good. Highlighting the features in a list helps to make them stand out. ILO1: Remove SGs. Otherwise, the key elements of a BWR design are included, and how they function to ensure the NPP is safe is included, except for the explanation of shutdown which suggests that reducing coolant flow shuts down the reaction in the reactor. Discussion of decay heat removal should be added.

		ILO2: Include more details on how control is achieved to demonstrate functioning knowledge. There is clearly declarative knowledge of how control is maintained.
3. *Explain* Safety features of the power plant. (Task 3, ILO1, ILO2)	2	Task 3: There is no specific discussion on the general principles of reactor safety. The units for the core damage frequency given are strange. The discussion on the reactor protection systems is very good, with good descriptions of the systems, and how they work. ILO1: Key elements of the safety features of the ABWR were clearly explained. IL02: The principles of operation for each of the safety features were also clearly explained.
4. *Calculate* Selected core parameters (Task 4, ILO3)	3	Task 4: The requested parameters were provided, and the explanation of their calculation is adequate, but could be improved by including the number of parts it was divided into, the presence of the reflector, and justification for the orifice. The results and discussion should be improved by comparing the calculated values with any published data. There should be more description of each of the output plots. IL03(a): Analysis of a nuclear reactor core was preformed, and an orifice was added to the existing design. Check comments for a resource on why to include an orifice.
5. *Calculate* CHF margins in a hot channel (Task 5, ILO4a)	1	Task 5: The requested plots were produced, but there was no discussion of the results. The results for the hot channel should be compared to the results from the average channel. All the results need more explanation. ILO4A: The MCPR value was found, but there is no reflection on what the result means.

6. *Calculate* Maximum cladding and fuel pellet temperature (Task 6, ILO4b)	1	Task 6: The required parameters were found. It should be improved by explaining what fuel, at what density, was used. And what the cladding material and gas gap compositions are. There should be discussion on why the hotspots are located where they are, and what simplifications have been made. ILO4b: The maximum cladding and fuel temperature were found, but they were not compared to legal and design requirements. There should be discussion on how the hot channel is important to reactor safety.

General comments: The citations are far apart. There are 11 pages with only one citation in Task 3. Material from class also needs to be cited in tasks 4-6. Zotero is great for managing citations if you are looking for a good tool and it works well with both Word and LaTeX.