The text discusses the considerations for selecting materials for the divertor in fusion reactors, with a focus on tungsten (W) and its alloys. Key points include:

1. **Importance of Tungsten**:
    - **Current Relevance**: Tungsten is considered the most relevant material due to its thermal handling capabilities and low tritium retention.
    - **Research and Development**: Extensive research on tungsten, including processing techniques, alloy development, and surface engineering, aims to reduce high-Z contamination and enhance core performance.
    - **Experience and Confidence**: Tungsten has been used successfully in devices like ITER, WEST, EAST, and AUG, providing a reliable material for divertors.
2. **Challenges with Other Materials**:
    - **Coatings**: Tungsten coatings on graphite have shown issues like erosion and exposure of the underlying graphite, which introduces contamination.
    - **Alternatives**: Other materials need higher readiness levels before being considered viable candidates for reactor walls.
3. **Advantages of Tungsten**:
    - **Thermal Properties**: Pure tungsten has excellent thermal properties and is robust under high heat fluxes.
    - **Experimental Utility**: Solid tungsten divertors are straightforward for initial testing and can simulate ITER-like conditions.
4. **Considerations for Tungsten Use**:
    - **Bulk vs. Coated**: Bulk tungsten is preferred for its robustness, while tungsten coatings might degrade and expose graphite, leading to contamination.
    - **W Alloys and Composites**: Exploring tungsten alloys and composites could provide improved performance but are less mature than pure tungsten.
    - **Solid Tungsten**: Suggested as the most appropriate step for DIII-D due to its reliability and alignment with international fusion research.
5. **Experimental Approach**:
    - **Stage Experiments**: Start with bulk tungsten, then transition to tungsten alloys, and eventually explore liquid lithium.
    - **DIII-D Research Plan**: Focus on tungsten to contribute valuable data for ITER and future devices, while also investigating impurity transport and material migration.
6. **Alternative Materials**:
    - **Silicon Carbide (SiC)**: Potentially useful but may face challenges like increased arcing.
    - **Liquid Metals**: Risky to implement but offer unique research opportunities.

Overall, the text emphasizes the need for robust and reactor-relevant divertor materials, with a strong preference for tungsten due to its extensive research, proven performance, and alignment with international fusion goals.