The document discusses the impact of changing wall materials in fusion reactors, focusing on the integration of high-performance core plasmas with reactor-relevant materials. Key points include:

1. **Compatibility with Metal Walls**: Scenarios currently working with carbon walls may not thrive with metal walls, necessitating real-time control and new diagnostic methods.
2. **Key Deliverables**:
    - Demonstrating routine operation with low disruptivity in high-Z (high atomic number) plasma-facing component (PFC) machines.
    - Using Electron Cyclotron Heating (ECH) for core impurity control.
    - Developing edge physics relevant to future power plant (FPP) machines.
    - Validating models of core impurity transport and understanding boundary impurity concentrations.
3. **Core Impurity Transport**: Evaluating how core plasma scenarios change with the removal of carbon impurities and the introduction of metal impurities. Metal impurities can lead to higher radiated power fractions, impacting core performance.
4. **DIII-D High Beta Experiments**: Experiments with tungsten (W) rings showed encouraging results with stable core performance despite increased radiated power, indicating potential compatibility with high-Z materials.
5. **Impact on Core Pedestal and Performance**: High-Z wall materials can affect energy confinement, stability, impurity transport, and access to high-performance regimes. Adequate core density control is essential to manage these effects.
6. **Advanced Scenarios and Material Choices**: High beta scenarios, such as those tested with tungsten, show promise. Evaluating other materials with better properties (e.g., higher melting points, lower deuterium/tritium retention) could significantly advance fusion reactor technology.
7. **Potential Challenges**:
    - Managing core impurity concentrations and disruptions caused by high-Z materials.
    - Ensuring effective current drive and heating while controlling impurities.
    - Quantifying effects on plasma breakdown and core performance under new wall conditions.

Overall, the document emphasizes the need for extensive research and testing to ensure that new wall materials can support high-performance core plasmas in fusion reactors, aiming to achieve better integration and improved reactor operation.