**Sandia Large Rotor Design Scorecard**

The following tables are suggested summaries of design information and design performance metrics for assessing the effect of blade innovations and redesign/optimization studies.

**Table 1: Blade Parameters (suggested)**

|  |  |
| --- | --- |
| **Parameter** | **Value** |
| Blade Designation (name) | ? |
| Design Wind Speed Class | IB, etc? |
| Blade Length (m) | 100? |
| Blade Weight (kg) | ? |
| Span-wise CG location (m) | ? |
| # shear webs | ? |
| Maximum chord (m) | ? (% span location?) |
| Lowest fixed base natural frequency (Hz) | ? |
| Control | Variable speed; collective pitch? |
| Special notes: | ?, Design Innovation? |

**Table 2. Blade Design Performance Metrics Summary**

|  |  |  |  |
| --- | --- | --- | --- |
| **Analysis** | **Design Load Condition (DLC) designation** | **Metrics** | **Notes/method** |
| Fatigue | IEC/GL designation or description (e.g. turbulent inflow) | X years fatigue life at Y% span | R=? data used; method? |
| Ultimate | IEC/GL designation or description (e.g. EWM50) | Max strain = X micro-strain  Allowable strain = Y micro-strain  Max/allowable = Z% | Span-wise location? (flapwise or edgewise?); codes/methods used? |
| Deflection | IEC/GL designation or description (e.g. ECD+R) | Max (X m) vs. allowable (Y m ); Clearance = Z m = X% | Codes/methods used? |
| Buckling | IEC/GL designation or description (e.g. EWM50, 0 deg pitch) | Min load factor ( ? ) vs.  allowable ( ? ); location? | Linear or nonlinear?, code used? |
| Flutter | -- | Flutter speed or margin (values?) | Method?, reference? |

**Table 3. Blade Design Bill of Materials**

*Please provide accompanying summary of material performance data*

|  |  |  |  |
| --- | --- | --- | --- |
| **Material** | **Description** | **Mass (kg)** | **Percent Blade Mass** |
| **Fiber #1** | Uni-axial Fiberglass ? | ? | X% |
| **Fiber #2** | Double Bias Fiberglass ? | ? | X% |
| **Fiber #3** | Random Mat ? | ? | X% |
| **Resin material** | Resin | ? | X% |
| **Core** | Foam | ? | X% |
| **Surface Material** | Coating | ? | X% |

**SAND2011-9113P**