The requirements were taken from the Statement of Work provided April 13, 2018, with the exception of the torque units in 2.1, 2.2 and 2.3 changing to in-lbs (they were ft-lbs). Please confirm all requirements by entering Yes in the ‘Tim Verified’ column. **Then sign and return to Jeff Anderson.**

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| --- | --- | --- |
| **Jeff Verified** | **Tim Verified** | **Requirement** |
| Yes |  | 1. New user interface providing a “real time” numerical display of current torque, angle and cycle count. |
| Open program and look at user interface. | | | |
| Yes |  | 2. Enhancement of Twister application that will allow the following types of torsional durability testing.  2.1. Fully Reversing (+/- n in-lbs)  2.2. Zero Based (+0/- n in-lbs)  2.3. User defined loading (+n in-lbs / -m in-lbs) for any number of loading conditions (duty cycle) |
| Tested using +/-500 in-lbs for first condition and +/-1500 in-lb for second condition. | | | |
| Yes |  | 3. Automatic shutdown capability of the test bench when certain conditions specified by Client have occurred. |
| Client asked for shutdown when angle of twist from current calibration cycle exceeds previous calibration cycle by 1.25 times. Verified using +/-500 in-lbs for first condition and +/-1500 in-lb for second condition prior to resetting the hasPreviousCalibrationCycle to 0 when entering a new test condition. Tim witnessed during on-site visit but would like to test actual shaft to try to reproduce. | | | |
| Yes |  | 4. User interface allowing an operator to create and edit a test, where a test consists of the following.  4.1. Any combination of conditions, where a condition consists of clockwise torque, counter-clockwise torque and number of cycles.  4.2. Automatic shutdown criteria. |
| 4.2 automatic shutdown criteria are hard-coded and the location shown to Tim on 9/11 visit. | | | |
| Yes |  | 5. Enhancement to the existing Twister user interface to provide an entry point to the new test module. |
| New button on main screen of program | | | |
| Yes |  | 6. Data storage for each test cycle.  6.1. Cycle number, maximum torque and angle in clockwise direction.  6.2. Cycle number, maximum torque and angle in counter-clockwise direction. |
| Data stored in c:\temp\twister.dat for current test (hard-coded). Previous tests are renamed to twister\_(DateTime.Now.Ticks).dat as discussed and shown to Tim. | | | |
| Yes |  | 7. Creation of a test bench simulator to aid in debugging and development of the new test types. |
| Disabled when deployed to user because it was only for development. Contact Jeff if this ever needs to be enabled. | | | |
| Yes |  | 8. Installation of new application on test machine. |
| Installed to the account on PS089 that I was logged into. Program setup file is at [\\pssrv\data2\Programs\Twister\setup.exe](file:///\\pssrv\data2\Programs\Twister\setup.exe). | | | |
| Yes |  | 9. Training of appropriate personnel on usage of new features. |
| Trained Tim onsite on 9/11/2018 | | | |

By verifying the above requirements, I confirm that this project is complete.

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Tim Kikkert Date