# MDC-15 Disruption database development

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| --- | --- | --- | --- |
| **TG priority:** Critical | **Start date:** 2009 | **Status:**  On-going | **Personnel exchange:**  Yes  |
| **IO priority:**   | **End date:**  N/A  | **Motivation:** Physics Basis |

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| --- | --- | --- | --- |
| **Device /****Association** | **Contact****Persons** | **2015 TGRequest** | **Activity (from JEX/JA spreadsheet)** |
| **2012** | **2013** | **2014** | **2015** |
| DIII-D  | N. Eidietis | Desirable | Committed | Committed | Committed | Committed |
| JET  | M. Tsalas  | Desirable | Committed | Committed | Committed | Committed |
| C-Mod  | R. Granetz | Desirable | Committed | Analysis | Analysis | Analysis |
| JT-60U  | Y. Kawano | Desirable | Analysis | Analysis | Analysis | Analysis |
| TCV  |  | Desirable |   | Considering | Analysis | Considering |
| MAST  | A. Thornton | Desirable | Committed | Committed | Committed |   |
| AUG  | G. Pautasso | Desirable | Committed | Committed | Committed | Committed |
| NSTX-U  | S. Gerhardt | Desirable | Analysis | Analysis | Analysis |   |
| Tore Supra  | F. Saint-Laurent | Desirable | Considering | Not doing | Not doing |   |
| KSTAR | S.H. Hahn | Desirable | Committed | Committed | Committed |   |
| FTU | G. Pucella | Desirable | Committed | Committed | Committed |   |
| Aditya  | R. Tanna  | Desirable |   |   |   |   |

**This template is based on the 2014 report.**

**Purpose:** The goals are to use cross-machine data to:

* Develop disruption science
* Develop empirical scalings for disruption parameters
* Validate disruption models over a range of machine sizes and operating regimes
* Extrapolate disruption parameters to ITER
* Provide confidence in design limits (EM forces, heat deposition)
* Identify range of outcomes, worst-case limits
* Provide input to detection and mitigation scenarios

**Results for 2014**

* This year’s effort has primarily focused upon preparing an IDDB journal article for publication and cleaning up inconsistencies in the database prior to preparing a publicly available distribution.
* Additional JT-60U disruption data was added as part of the review process.
* The final draft of the journal publication received the final authorization from the nine participating institutions in mid-October 2014, and is expected to be submitted to Nuclear Fusion by the end of November 2014.
* A significant new analysis result coming out of the article preparation and subsequent reviews is the establishment of a probable range for the plasma cooling time (the time from impurity arrival at the plasma edge to the start of the thermal quench) for neon impurity injection in ITER.

**Plans for 2015**

* Publication of the IDDB journal article will be completed.
* A public version if the IDDB will be made available subject to ITPA database guidelines.
* Once those processes are complete, new data collection will commence. The new data collection will focus upon defining vertical displacement timescales and thermal quench timing for discharges already available in the IDDB.

**Background:** This is a continuation of MDC-15, which began in 2009. The ITPA Disruption Database was initiated several years ago under the MHD Topical Group. The first phase of the database focused on characteristics of the current quench. The database was subsequently extended to include halo current data. Massive gas injection data has recently been added.