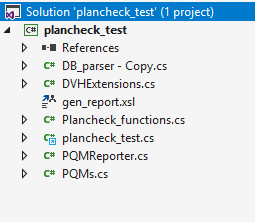
**A Brief description of all files and important functionality in PlanCheck**

Below we have created a short overview to help you take over the script, understand how it works and adapt it as necessary to your local settings.

All files included in the PlanCheck solution can be seen in Figure 1 below.



**Figure 1:** An overview of all files in the PlanCheck solution.

The files *gen\_report.xsl*, *PQMReporter.cs*, *PQMs.cs,* and *DVHExtensions.cs* are based on the project PlanQualityMetrics, available at the GitHub of Varian Medical Systems, Inc (Palo Alto, CA) (1). The three first files have been edited compared to PlanQualityMetrics while *DVHExtensions.cs* was left unaltered.

**Table 1:** An overview of the files, classes, structs, and some chosen important methods in the files in the PlanCheck solution. For a description of classes, methods and stucts, see Table 2.

|  |  |  |  |
| --- | --- | --- | --- |
| File name | Description of file | Important Classes or Structs | Important methods in classes |
| plancheck\_test.cs | First file called when script is executed. From here both dose and plan check methods are called | Constraint  Script | In Script:  Execute  getDoseLimits  manual  getEverythingButDosis  rel\_vol\_check  abs\_vol\_check  dmean\_check |
| PQMReporter.cs | In the method dumpReportXML it is decided in what order information is written in the report | PlanSetupReporter  PQMReporter | In PlanSetupReporter:  dumpReportXML  In PQMReporter:  generateReport  WriteDoseStatisticsXML\_MeanDose  WriteDoseStatisticsXML\_RelativeVolume  WriteDoseStatisticsXML\_AbsoluteVolume  WriteGeneralStatisticsXML  WriteManualStatisticsXML |
| Plancheck\_functions.cs | Contains all plan checks | Plancheck\_functions | All methods for checking technical aspects of the plan |
| DB\_parser – Copy.cs | Reads from the SQL database | DB\_diag | In DB\_parser\_copy:  Read\_diagnose  Read\_structure  Output\_check |
| gen\_report.xsl | Sets appearance of report |  |  |
| DVHExtensions.cs | Extension to class VMS.TPS.PlanningItem implemented in PlanQualityMetrics (1) |  |  |
| PQMs.cs | Adds results from checks to the report. | DoseAtVolume  GeneralInfo  Manual  MeanDoseLimit |  |

**Table 2:** A brief description of important methods and classes.

|  |  |  |
| --- | --- | --- |
| Name of class, struct or method | Description of functionality | Needs editing when implementing this script outside of Copenhagen 😊 |
| Execute (in class Script) | The first method called when executing an ESAPI script, as documented in the reference guide (2). | Yes |
| getDoseLimits (in class Script) | Dose limits are read from the data base and checked against the plan, this involves calls to the methods: dmean\_check, rel\_vol\_check, and abs\_vol\_check in plancheck\_test.cs | Yes |
| Manual (in class Script) | The dynamic list of aspects to be checked manually in the plan is built. | Yes, at least a translation from Danish |
| getEverythingButDosis (in class Script) | Technical aspects of the plan is checked against the plan. From this method the check functions in Plan\_functions.cs are called. | Many checks can be kept as is but some might not be relevant for your department. |
| rel\_vol\_check (in class Script) | Compares a constraint in the database on dose to a relative volume to what was found in the plan. | No |
| abs\_vol\_check (in class Script) | Compares a constraint in the database on dose to an absolute volume to what was found in the plan. | No |
| dmean\_check (in class Script) | Compares a constraint in the database on mean dose to what was found in the plan. | No |
| generateReport (in PQMReporer) | Decides where reports will be stored and generates MD hash for patient ID. | Yes. You need to specify where to store the reports. |
| WriteDoseStatisticsXML\_MeanDose (in PQMReporer) | When this is called a result of a mean dose check (dmean\_check) is written to the report | No |
| WriteDoseStatisticsXML\_RelativeVolume (in PQMReporer) | When this is called a result of a check of dose to a relative volume (rel\_vol\_check) is written to the report | No |
| WriteDoseStatisticsXML\_AbsoluteVolume (in PQMReporer) | When this is called a result of a check of dose to a absolute volume (abs\_vol\_check) is written to the report | No |
| WriteGeneralStatisticsXML (in PQMReporer) | Used for writing results for all automated checks (in Plancheck\_functions) to the report. | No |
| WriteManualStatisticsXML (in PQMReporer) | Writes all checks to be done manually, selected in the method manual based on what kind of plan it is. | No |
| dumpReportXML (in PlanSetupReporter) | In this method we call:   * getDoseLimits * getEverythingButDosis * manual   in the class Script in plancheck\_test.cs. These call   * rel\_vol\_check * abs\_vol\_check * dmean\_check   and all the “Write…StatisticsXML” modules.  Thus: The order in which getDoseLimits, getEverythingButDosis, and manual are called in dumpReportXML will decide in what order (top to bottom) the three parts of the report shown. | No |
| Plancheck\_functions (a class in it self) | All automated checks | Many checks can be kept as is but some might not be relevant for your department. |
| DoseAtVolume (a struct) | Decides the appearance in the report of the results of rel\_vol\_check and abs\_vol\_check | No |
| GeneralInfo (a struct) | Decides the appearance in the report of the results of automated checks | No |
| Manual (a struct) | Decides the appearance in the report of the results of manual checks | No |
| MeanDoseLimit (a struct) | Decides the appearance in the report of the results of rel\_vol\_check and abs\_vol\_check | No |
| DB\_diag (a class in class DB\_parser\_copy) | Contains information retrieved from database | No |
| Read\_diagnose (in DB\_parser\_copy) | Fetches data from database by plan code | Yes, must be changed to local database login, address and structure. |
| Output\_check (in DB\_parser\_copy) | Writes result of check back to database for auditing purposes | Yes, must be changed to local database login, address and structure. |

1. <https://github.com/VarianAPIs/Varian-Code-Samples/tree/master/Eclipse%20Scripting%20API/projects/PlanQualityMetrics>
2. Eclipse Scripting API Reference Guide, Varian Medical Systems, Palo Alto, CA