APPLICATION NOTE

AN-119

RDS Intranet Crystal Report Internals

Overview

RDS Intranet is bundled with Crystal Reports for tailoring custom reports for specific operations. In addition, example reports and SQL stored procedures delivered with RDS Intranet are provided as the starting point for custom reports.

This note is for RDS Intranet version 1.21 or later. On line help provides details on these aspects of a custom report:

- Crystal Report file.
- SQL stored procedure.
- RDS Intranet report parameters ASP page.
- Uploading report to server and adding reference to it in the RDS Intranet database.

This document provides internal details of the RDS Intranet example reports:

- Physical names of Crystal Report files.
- Parameters of SQL stored procedures.
- Database schemas of each report.

RDS Intranet Existing Reports

Reports delivered with RDS Intranet are listed in table 1. Crystal Report files (RPT) are located in the C:\InetPub\wwwroot\Reedholm\DataReports subdirectory on the RDS Intranet server. Reports call an SQL stored procedure to obtain desired data.

Raw and lot summary reports have landscape versions that use the same stored procedures. The filenames are the same as shown in table 1 except with "_L" appended (e.g., LotSumAllWafers_L.rpt for the landscape version.)

Sub Stored Procedures

Stored procedures LotSummaryStats (*) and LotWaferSummaryStats (†) call stored procedures in tables 2 and 3 respectively based on the Test Group parameter shown in each table.

Parameters may be passed from either Acquire or Examine into a stored procedure. Table 5 shows the parameters that can be passed.

Report	Crystal Reports File	Stored Procedure
Lot Summary – CCD (All Wafers)	LotSumAllWafersCCD.rpt	LotSummaryStatsByTest
Lot Summary (All Wafers)	LotSumAllWafers.rpt	LotSummaryStats*
Lot Summary (Each Wafer)	LotSumEachWafer.rpt	LotWaferSummaryStats†
Lot Test Aborts	LotAbortsReport.rpt	LotAbortsReport
Raw Data Report	RawDataReport.rpt	LotRawDataReport
Raw Data Report - CCD	RawDataReportCCD.rpt	LotRawDataReportCCD
Raw Data Report – Package Parts	RawDataReportPPart.rpt	LotRawDataReportPPart
Test Limits Report	LotLimits.rpt	LotLimitsReport
Test Time Summary	LotTestTimeSummary.rpt	LotTestTimeReport
Wafer Pass-Fail by Die (CCD Compliant)	LotDispositionByDie.rpt	LotDispositionByDie
Wafer Pass-Fail by Test	LotDispositionByTest.rpt	LotDispositionByTest
Wafer Pass-Fail by Test (based on number of die)	LotDispByTestOnDieCnt.rpt	LotDispByTestPerNumDie
Wafer Status Report	LotWaferStatus.rpt	LotWaferStatusReport
Wafer Time Summary	LotWaferTimeSummary.rpt	LotWaferTimeReport

Table 1 – Crystal Report File Names & Associated Stored Procedures

Test Group	Stored Procedure
Combine Tests	LotSummaryStatsByTest
Total per Intradie	LotSummaryStatsByTestandITD
Total per Test	LotSummaryStatsByTestIDOrder

Table 2 – Lot SummaryStats Subprocedures

Test Group	Stored Procedure
Combine Tests	LotSummaryStatsByWafer_Test
Total per Intradie	LotSummaryStatsByWafer_TestandIDT
Total per Test	LotSummaryStatsByWafer_TestIDOrder

Table 3 – LotSummaryStatsByWafer Subprocedures

Header Report

RDS Intranet standard reports include a sub-report named LotHeader.rpt. The header file must be copied before modifying it. Afterwards, the standard lot header file is deleted and the new file name is inserted in the new report file Report Header section.

FormatNum Function

Example reports call FormatNum created to assist in formatting numbers within Crystal Reports. FormatNum parameters are in table 4. RDS on line help has details on format patterns. The Visual Basic Format procedure is described on the Microsoft website.

FormatNum is inside crUFLRIFormat.dll, which is in C:\Windows\Crystal on the RDS Intranet server. This DLL must be copied to and registered (REGSVR32) on any PC used to edit reports that are based on Reedholm example reports.

Argument	Description
Number	Number to be formatted
NumDigits	Number of significant digits used
Format Type	0 – None/Pattern 1 – Engineering 2 – Scientific
Format Pattern	Format pattern consistent with Visual Basic “Format” command

Table 4 – FormatNum Arguments

ConvertAnyStrToNum Function

ConvertAnyStrToNum accepts an input string and returns a double and is also in crUFLRIFormat.dll. It converts input numbers, such as test limits and target, from a string to a number that can then be converted using FormatNum to match the other report numbers. This function is needed because input numbers are stored as strings in the database using engineering notation, e.g., 100µ for 10^{-4}.

Acquire Report Execution

Figure 1 shows the steps taken by Acquire when it is configured to execute a report during lot testing.

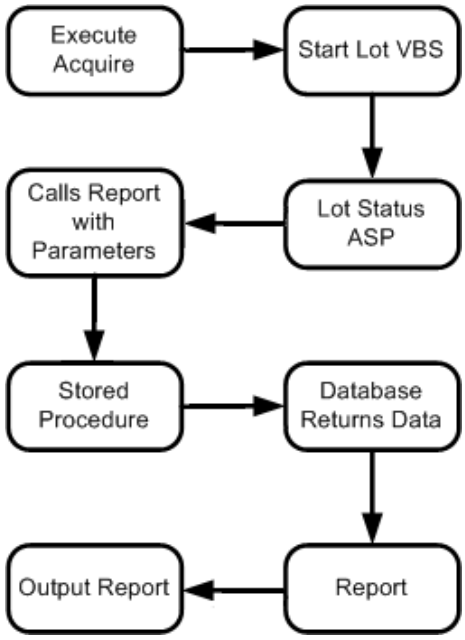

Figure 1 – Acquire Report Execution Steps

Database Tables Used in Reports

Figures 2 through 20 illustrate database schemas for all standard reports. They can be used to better understand data flow for the various reports and as an aid in building custom reports.

Stored Procedure	Parameter (In Order)	Description
LotAbortsReport LotDispositionByTest LotTestTimeReport LotWaferStatusReport	Language_ID	1 – Default English
	Lot_ID	Database Lot_ID key of lot data to be extracted
LotLimitsReport	Lot_ID	Database Lot_ID key of lot data to be extracted
LotSummaryStats	PrintOrder	0 – Test Order, 1 – Print Order
	TestGroup	0 – Combine Tests, 1 – Total Per Intradie, 2 – Total Per Test
	Lot_ID	Database Lot_ID key of lot data to be extracted
LotWaferSummaryStats	PrintOrder	0 – Test Order, 1 – Print Order
	TestGroup	0 – Combine Tests, 1 – Total Per Intradie, 2 – Total Per Test
	Wafer_ID	0 – All Wafers, <> 0 – Only the ID'ed Wafer
	Lot_ID	Database Lot_ID key of lot data to be extracted
LotSummaryStatusByTest	PrintOrder	0 – Test Order, 1 – Print Order
	CCD_Data	0 – Don't Extract CC, 1 – Extract CCD Data
	Lot_ID	Database Lot_ID key of lot data to be extracted
LotSummaryStatsByTestandIDT LotSummaryStatsByTestIDOrder	Lot_ID	Database Lot_ID key of lot data to be extracted
	PrintOrder	0 – Test Order, 1 – Print Order
LotSummaryStatsByWafer_Test LotSummaryStatsByWafer_TestandIDT LotSummaryStatsByWafer_TestIDOrder	Lot_ID	Database Lot_ID key of lot data to be extracted
	Wafer_ID	0 – All Wafers, <> 0 – Only the ID'ed Wafer
	PrintOrder	0 – Test Order, 1 – Print Order
LotRawDataReport LotRawDataReportCCD LotRawDataReportPPart	NumCols	Number of die columns on the page (default is 5)
	PrintFail	0 – Print all data, 1 – Only Print Fail Data
	Lot_ID	Database Lot_ID key of lot data to be extracted
LotDispositionByDie	Handling	1 – # of die to pass, 2 – # of die to fail 3 – % of die to pass, 4 – % of die to fail
	DieToPass	Number of percentage of die based upon Handling
	Limits	1 – Inner, 2 – Center, 3 – Outer
	CriticalTest	0 – Critical test failure does not fail wafer 1 – Any critical test failure fails the wafer
	Language_ID	1 – Default English
	Lot_ID	Database Lot_ID key of lot data to be extracted
LotDispByTestPerNumDie	Handling	1 – # of die to pass, 2 – # of die to fail 3 – % of die to pass, 4 – % of die to fail
	DieToPass	Number of percentage of die based upon Handling
	Limits	1 – Inner, 2 – Center, 3 – Outer
	TestGroup	0 – Combine Tests, 1 – Total Per Intradie, 2 – Total Per Test
	CriticalTest	0 – Critical test failure does not fail wafer 1 – Any critical test failure fails the wafer
	Lot_ID	Database Lot_ID key of lot data to be extracted
LotDispositionByTest	Lot_ID	Database Lot_ID key of lot data to be extracted
	Language_ID	1 – Default English

Table 5 – Stored Procedures Passed Parameters

Report	Parameter (In Order)	Description
LotAbortsReport.rpt LotTestTimeSummary.rpt LotWaferStatus.rpt LotWaferTimeSummary.rpt	Language_ID	1 – Default English
	Lot_ID	Database Lot_ID key of lot data to be extracted
LotDispByTestOnDieCnt.rpt	Handling	1 – # of die to pass, 2 – # of die to fail 3 – % of die to pass, 4 – % of die to fail
	DieToPass	Number of percentage of die based upon Handling
	Limits	1 – Inner, 2 – Center, 3 – Outer
	TestGroup	0 – Combine, 1 – Total Per Intradie, 2 – Total Per Test
	CriticalTest	0 – Critical test failure does not fail wafer 1 – Any critical test failure fails the wafer
	Lot_ID	Database Lot_ID key of lot data to be extracted
LotDispositionByDie.rpt	Handling	1 – # of die to pass, 2 – # of die to fail 3 – % of die to pass, 4 – % of die to fail
	DieToPass	Number of percentage of die based upon Handling
	Limits	1 – Inner, 2 – Center, 3 – Outer
	CriticalTest	0 – Critical test failure does not fail wafer 1 – Any critical test failure fails the wafer
	Language_ID	1 – Default English
	Lot_ID	Database Lot_ID key of lot data to be extracted
LotDispositionByTest.rpt	Limits	1 – Inner, 2 – Center, 3 – Outer
	Lot_ID	Database Lot_ID key of lot data to be extracted
	Language_ID	1 – Default English
LotLimits.rpt	Num Format	0 – None, 1 – Engineering, 2 – Scientific
	NumDigs	Number of digits
	NumPattern	Number Pattern
	Lot_ID	Database Lot_ID key of lot data to be extracted
LotSumAllWafers.rpt LotSumAllWafers_L.rpt LotSumAllWafersCCD.rpt LotSumAllWafersCCD_L.rpt LotSumEachWafer.rpt LotSumEachWafer_L.rpt	Num Format	0 – None, 1 – Engineering, 2 – Scientific
	NumDigs	Number of digits
	FailureFlag	0 – None, 1 – Bold, 2 – Color, 3 – Underline
	PrintFail	Only Print Failed Data (True/False)
	TargetValue	Show Target Value (True/False)
	NumPattern	Number Pattern
	PrintOrder	0 – Test Order, 1 – Print Order
	TestGroup	0 – Combine, 1 – Total Per Intradie, 2 – Total Per Test **(Field does not exist w/ CCD Reports)**
	Wafer_ID	0 – All Wafers, <> 0 – Only the ID'ed Wafer **(Field only exists w/ EachWafer reports)**
	CCD_Data	0 – Don't Extract CCD, 1 – Extract CCD Data **(Field only exists w/ CCD Reports)**
	Lot_ID	Database Lot_ID key of lot data to be extracted
RawDataReport.rpt RawDataReport_L.rpt RawDataReportCCD.rpt RawDataReportCCD_L.rpt RawDataReportPPart.rpt RawDataReportPPart_L.rpt	Num Format	0 – None, 1 – Engineering, 2 – Scientific
	NumDigs	Number of digits
	FailureFlag	0 – None, 1 – Bold, 2 – Color, 3 – Underline
	PrintFail	Only Print Failed Data (True/False)
	TargetValue	Show Target Value (True/False)
	NumPattern	Number Pattern
	NumCols	Number of die columns on the page (default is 5)
	PrintFail	0 – Print all data, 1 – Only Print Fail Data
	Lot_ID	Database Lot_ID key of lot data to be extracted

Table 6 – Crystal Report Passed Parameters

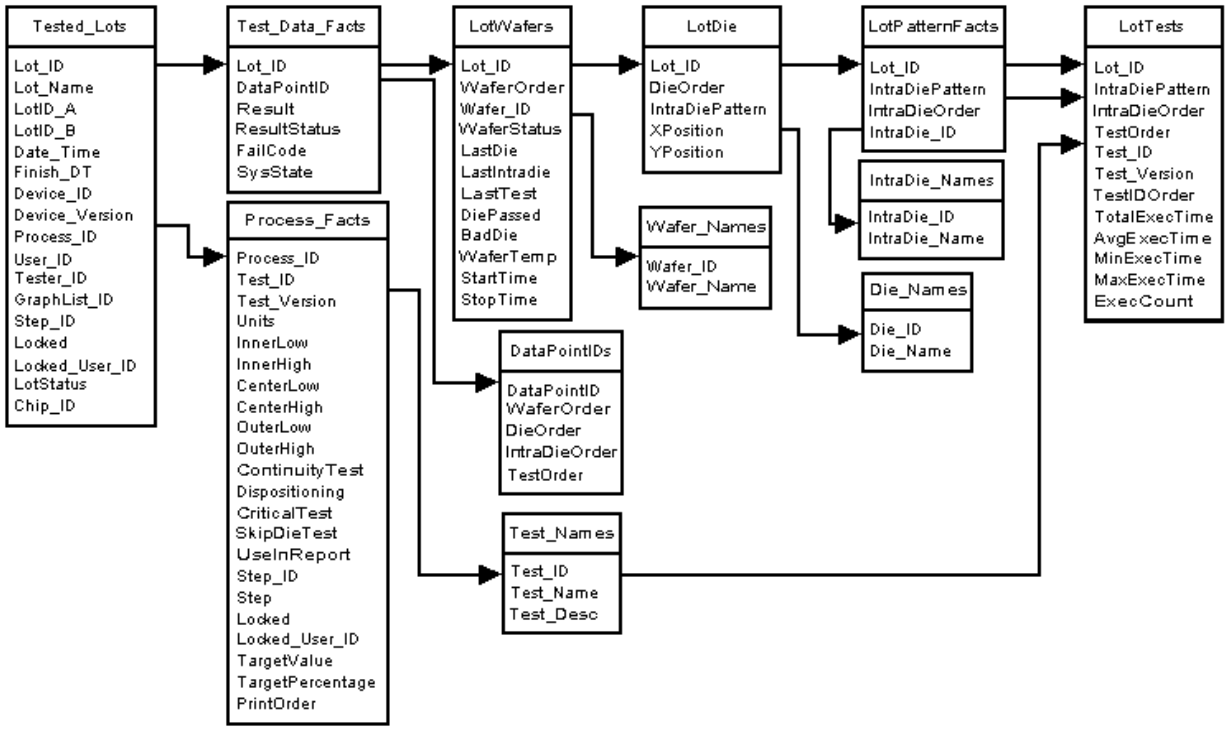

Figure 2 - Raw Data Report Schema

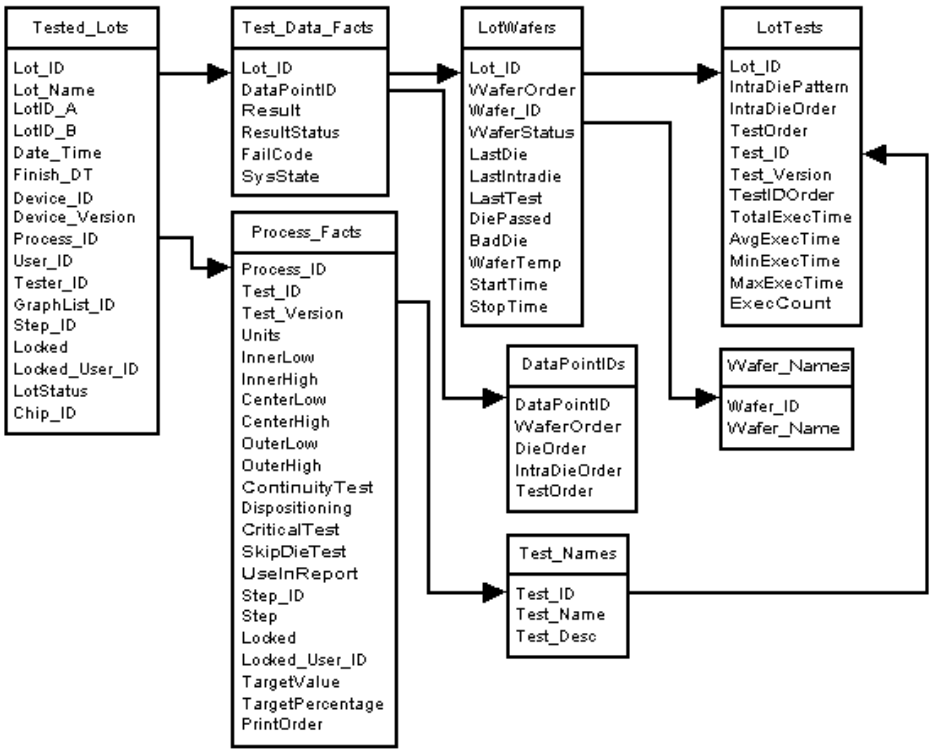

Figure 3 – Raw Data Report – Package Part Schema

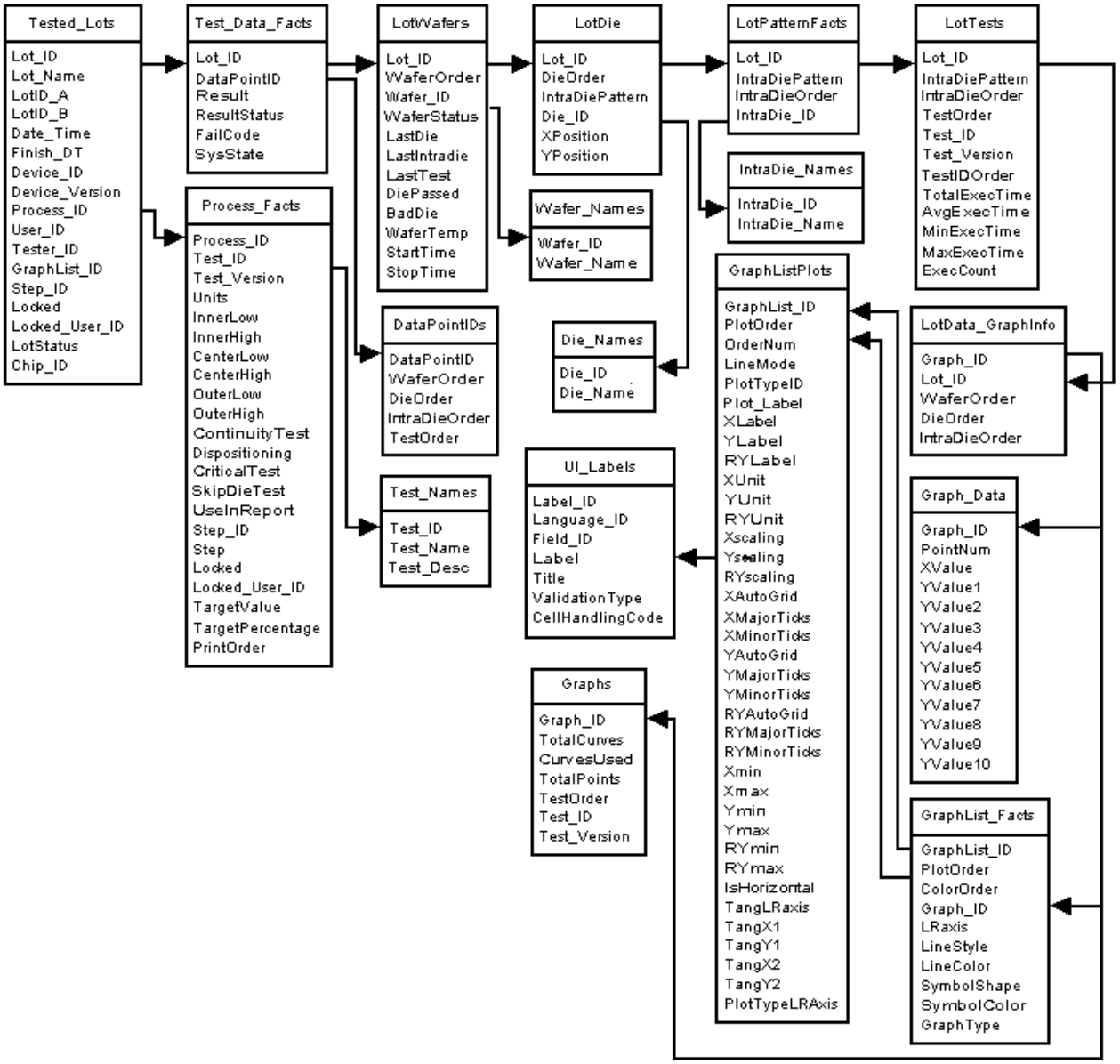

Figure 4 - Raw Data Report CCD Schema

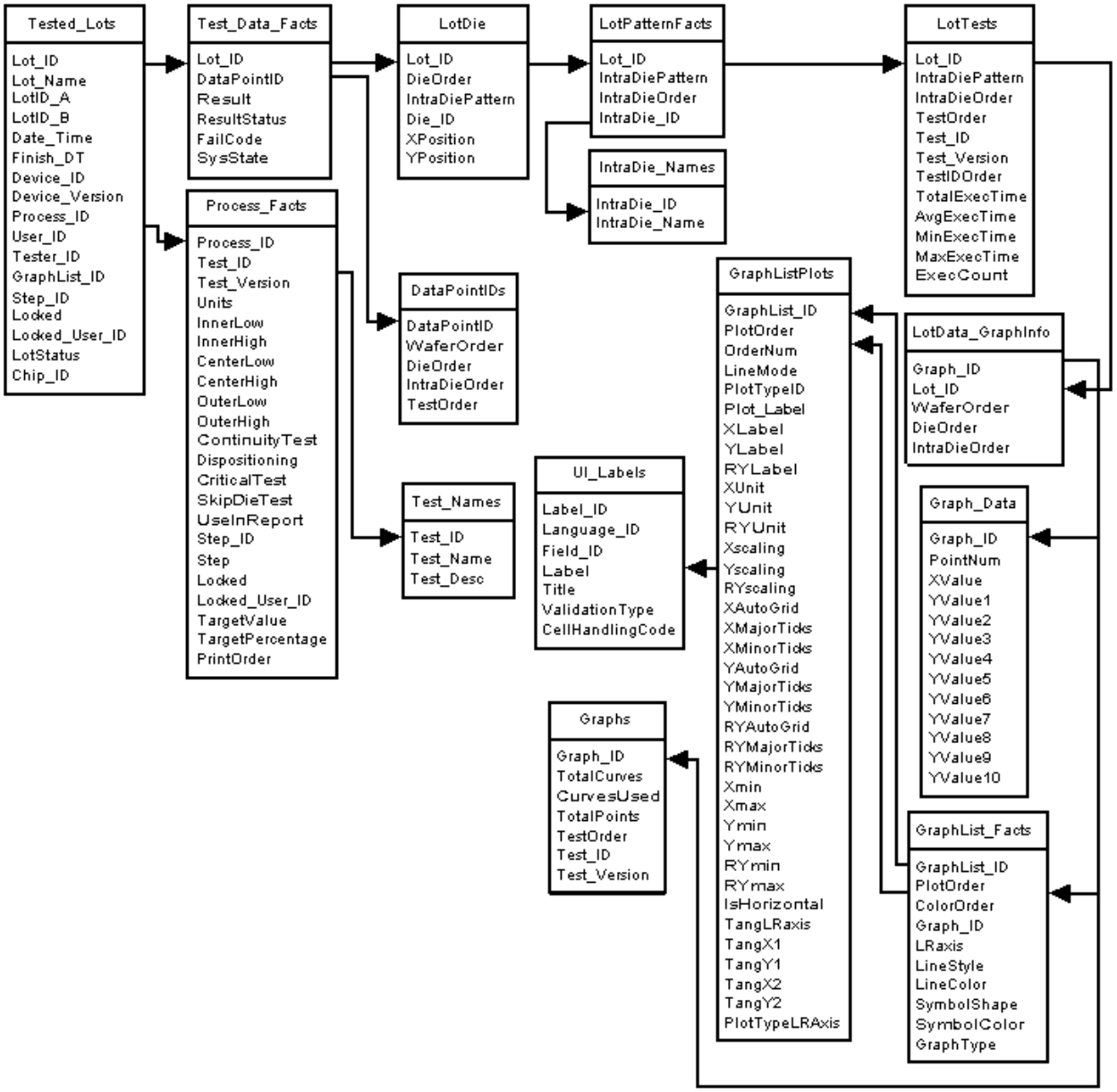

Figure 5 – Lot Summary – CCD (All Wafers)

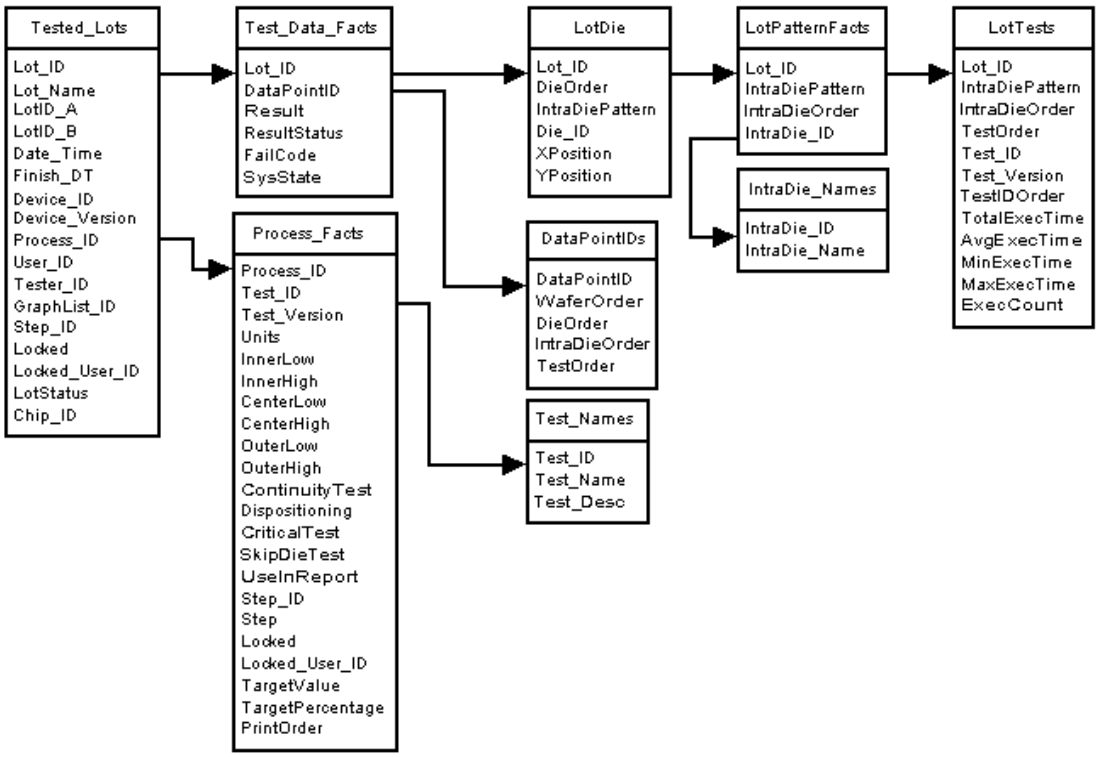

Figure 6 – Lot Summary (All Wafers)

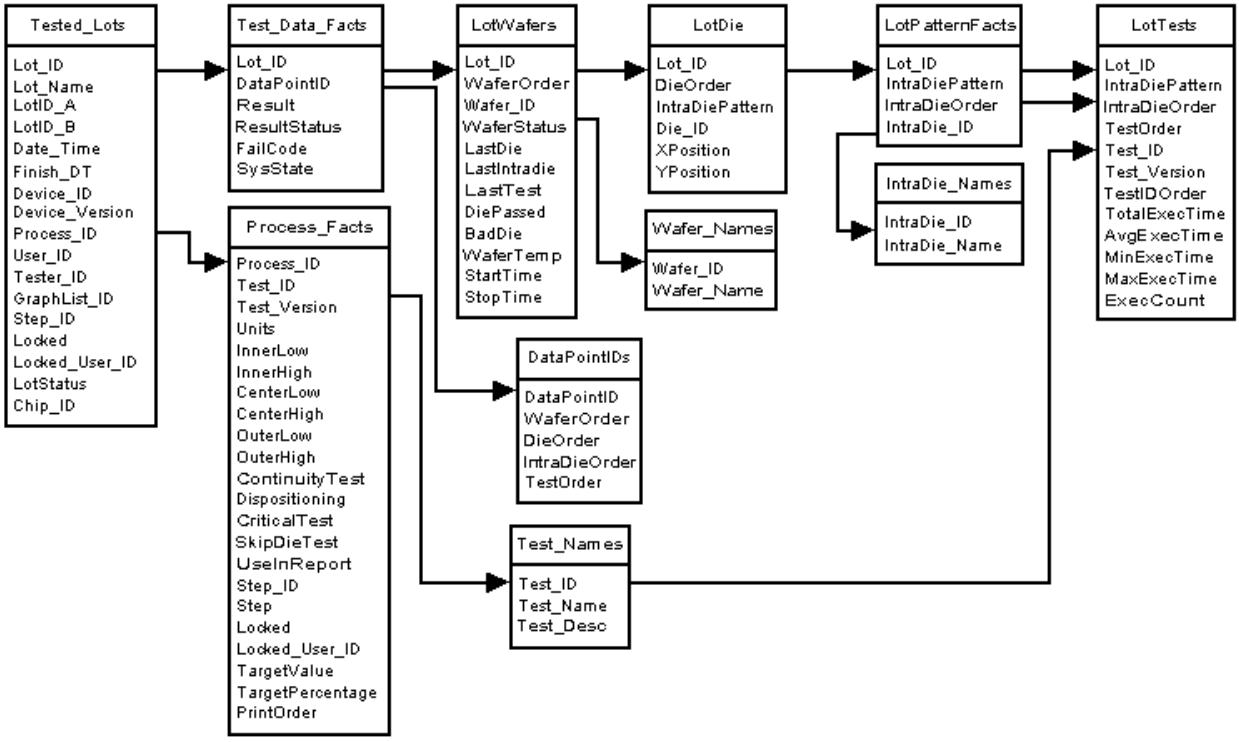

Figure 7 – Lot Summary (Each Wafer)

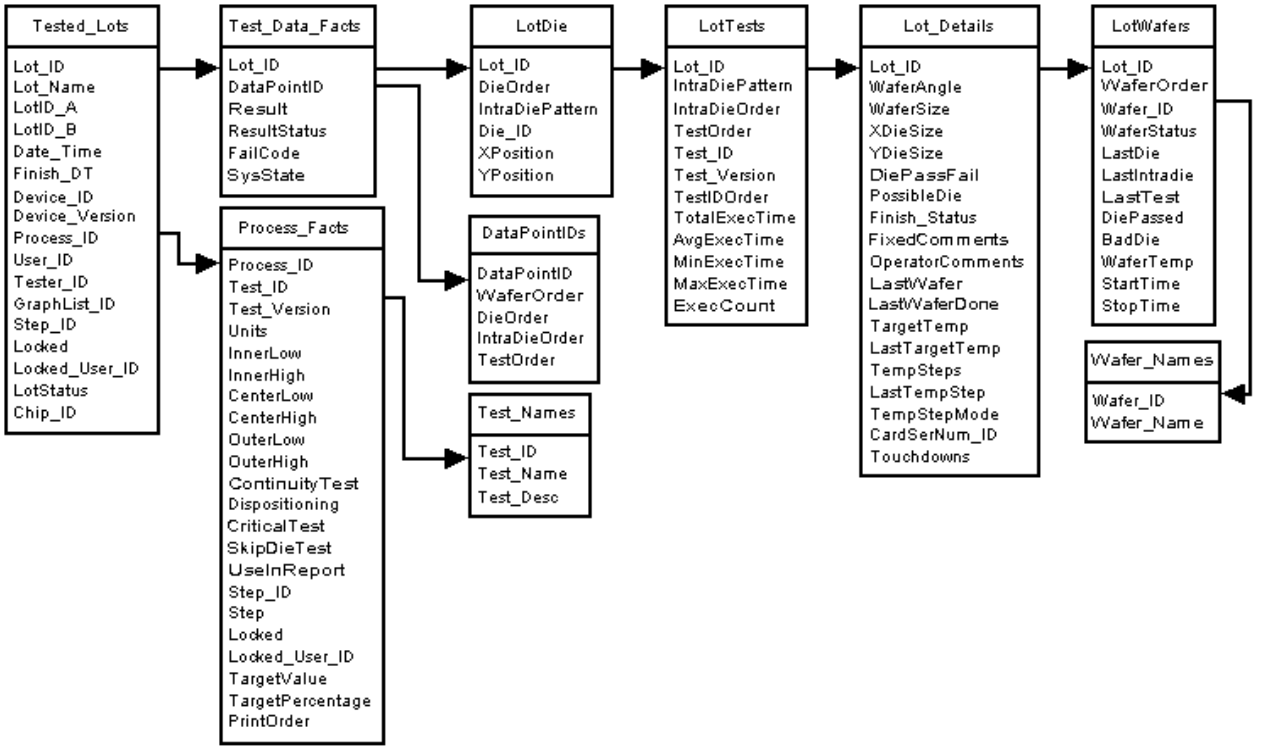

Figure 8 – Wafer Pass/Fail by Test (based on the number of die)

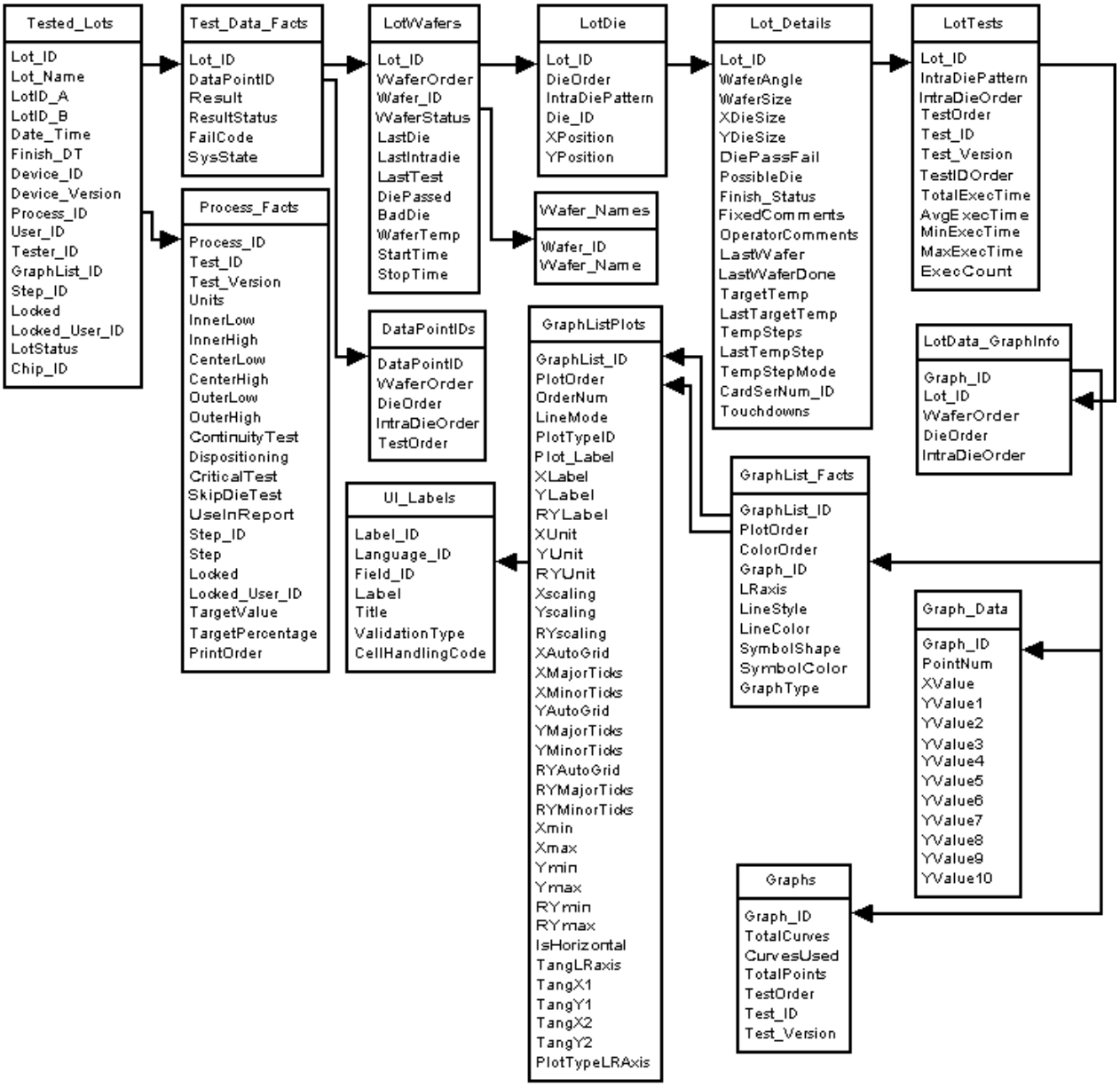

Figure 9 – Wafer Pass/Fail by Die

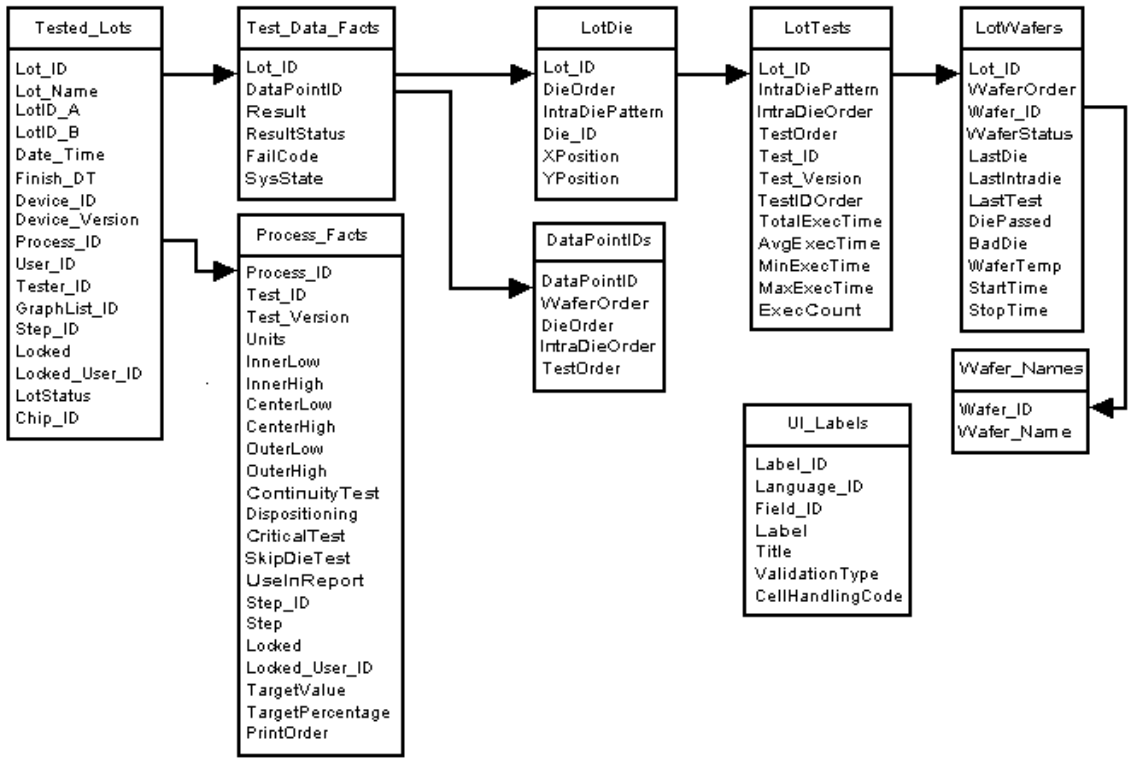

Figure 10 – Wafer Pass/Fail by Test

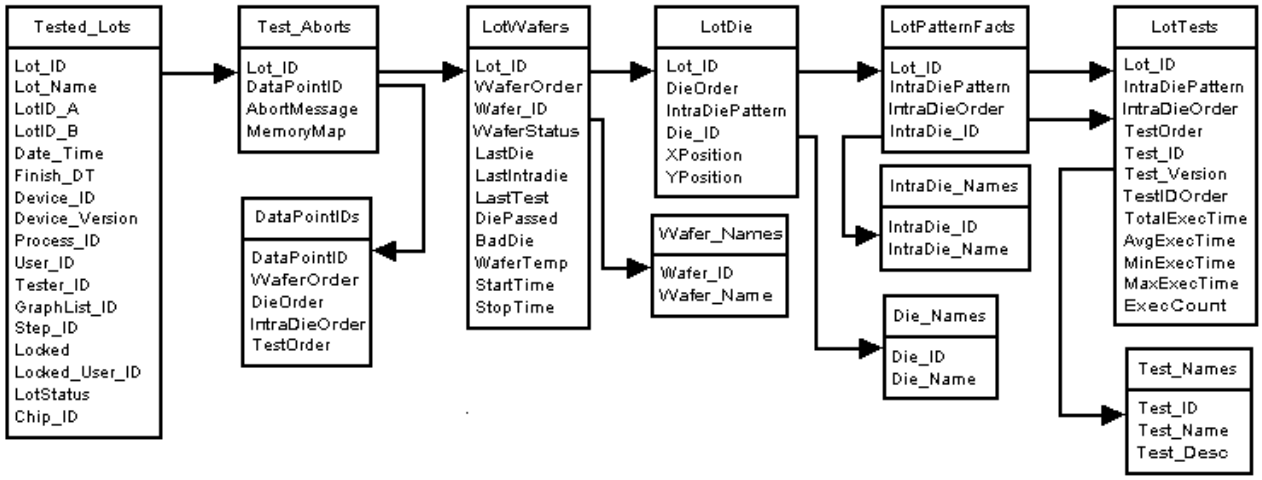

Figure 11 – Lot Test Aborts

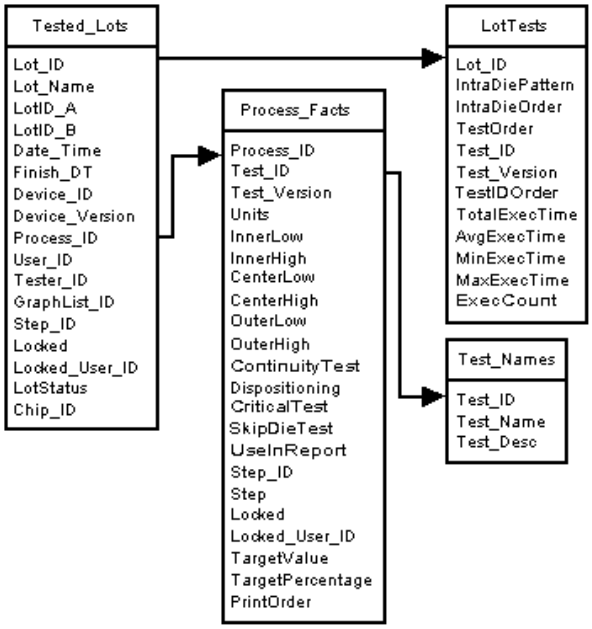

Figure 12 – Test Limits Report

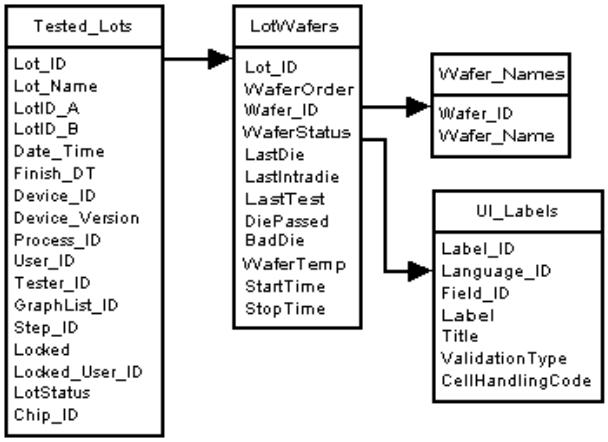

Figure 13 – Wafer Status Report

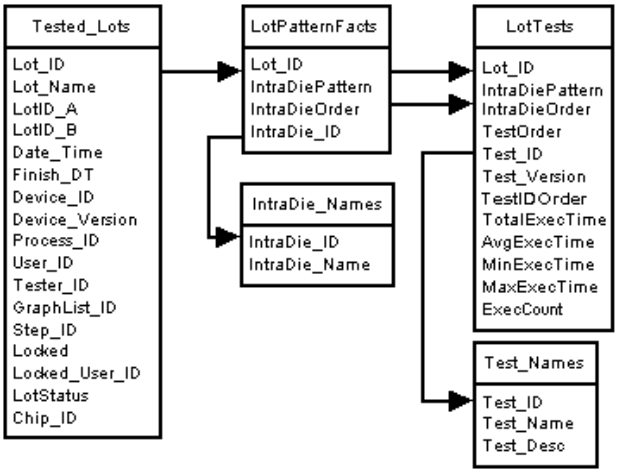

Figure 14 – Test Time Summary Report

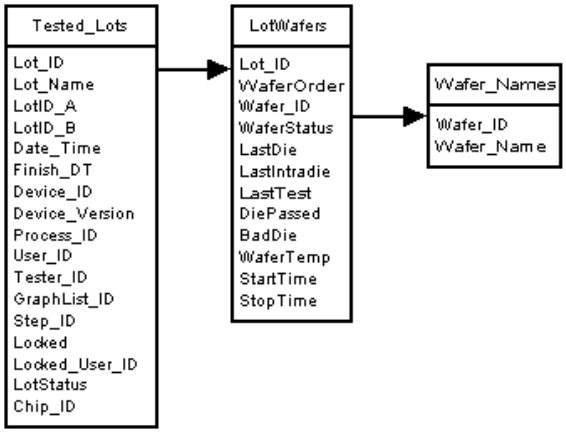

Figure 15 – Wafer Time Summary Report

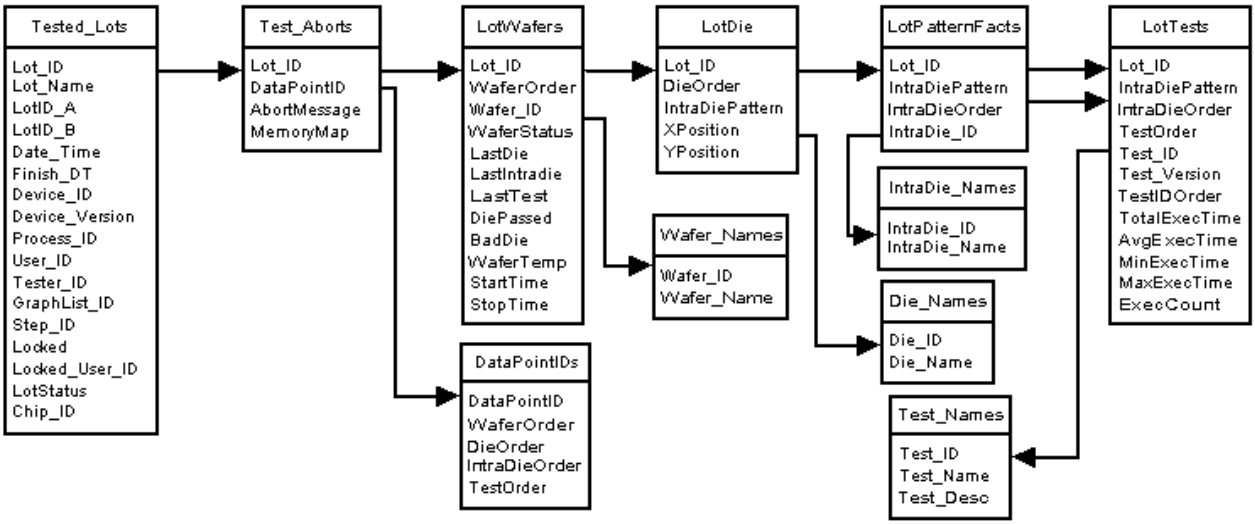

Figure 16 – Lot Test Aborts Report

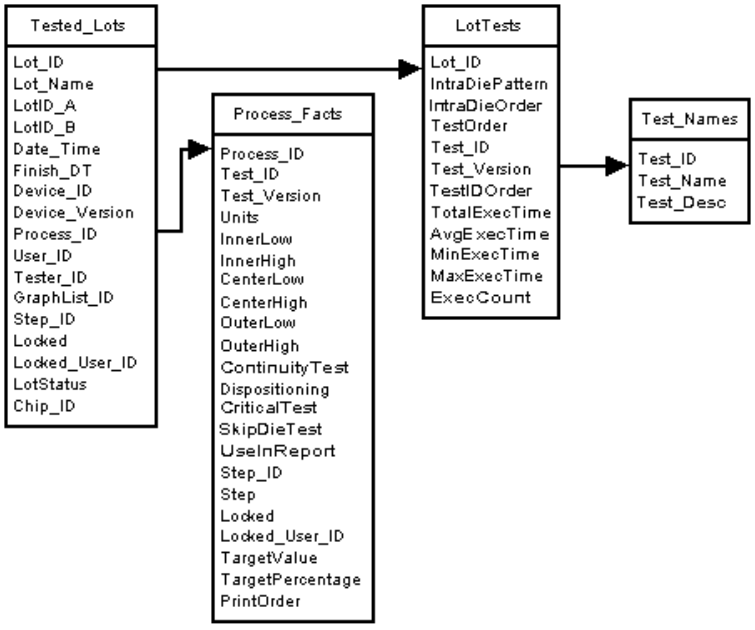

Figure 17 – Lot Test Limits Report

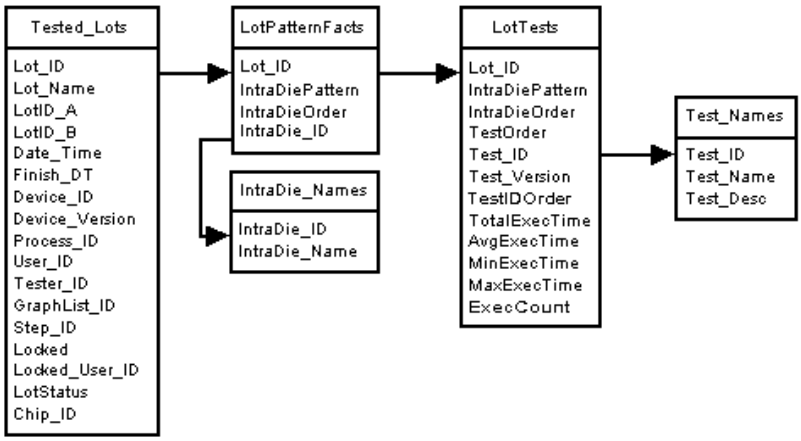

Figure 18 – Lot Test Time Report

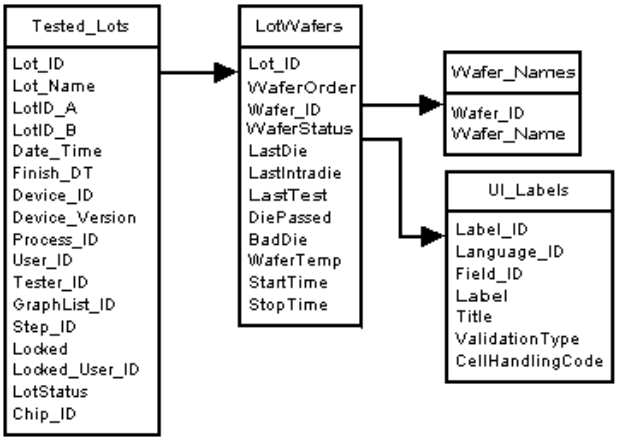

Figure 19 – Lot Wafer Status Report During Acquire Testing

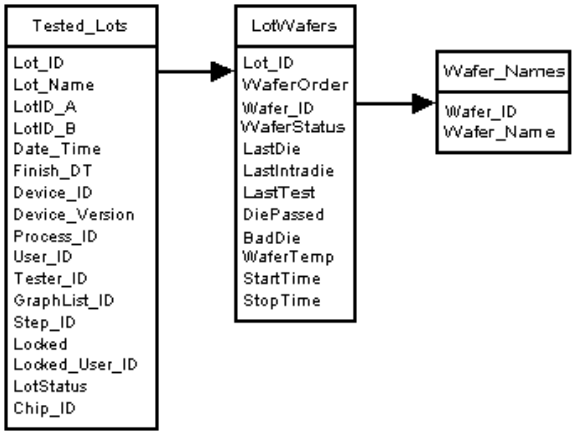

Figure 20 – Lot Wafer Process Time Report