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### Integrating LIMS with MS Windows programs

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#### Abstract

PCs with MS-Office products (WORD, EXCEL) are commonly available at every workplace in analytical laboratories. These programs are used for data processing (EXCEL) and reporting (WORD). If a LIMS is available to store information the question often arises, if and how these WINDOWS programs can be integrated into a LIMS environment. The advantages are obvious: (a) the user can still employ his everyday programs; (b) a spreadsheet is often more appropriate for data input and processing than a LIMS; (c) automatic insertion of LIMS data into a Word document can simplify reporting considerably. Nevertheless, few points must be considered: (a) fast direct data access is necessary; (b) data validity must be guaranteed; (c) data are usually not transferred directly into the database but are presented to the LIMS as a file, which has to pass through a checking procedure; (d) GLP validation of all components (LIMS as well as EXCEL) is required. **Our solutions.** We employ SQL<sup>®</sup>—LIMS from PE installed on an Alpha Vax under OpenVMS. For data input and reporting we developed several EXCEL spreadsheets. To *extract data* from the LIMS database we used the ODBC mechanism based on ORACLE SOL<sup>®</sup>—NET 2. The ODBC connection is integrated into

a visual-basic module of the EXCEL sheet. To ensure data validity we use the "LIST of Values"™ method. A necessary prerequisite is a download from LIMS of a set of allowed values. Since with analytical data a check against a set of allowed values is often not possible, the amount of values necessary for checks is limited. Plausibility checks can well be performed within an EXCEL spreadsheet. To *transfer data* to LIMS we employ two mechanisms. A third (stored procedures) is being tested: (a) an NFS connection between a NOVELL-Netware Server and the LIMS"VAX; (b) ORACLE tables on the VAX, into which the data are loaded and then automatically spooled into the respective files. The NFS-connection between the Novell Server (Netware 4.1) and the VAX avoids the necessity for special drivers on the PC. This connection maps a VAX directory onto the PC.



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## Keywords

LIMS; MS Windows; GLP validation

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