**Memorandum:**

**To:** Election Assistance Commission (EAC)

**From:** Jacques Hulshof < Jacques.hulshof@nedap.com>
Member IEEE and member of the IEEE P1583 Standards group.

**Date:** January 7th, 2005

**Subject:** Single solution character of the IEEE P1583 Draft 5.3.2 Voting System Standards

The draft Voting System Standard you received from the P1583 working group is the product of many years of effort. The draft has been preceded by the voluntary 1990 voting system standards and the 2002 voting system standards both published by the Federal Election Committee. Nedap as the largest and most experienced European voting system manufacturer (since 1967) contributed to these standards by giving comments and sending translations of European standards to the FEC. We joined the IEEE P1583 working group in May 2002 and are pleased to have been allowed to share our knowledge and experience on DRE voting systems with the group of fine engineers and scientists, that strives to develop the high quality standards necessary to give the voters trust and confidence in the election results. Nedap introduced its first generation DRE's in 1978 and the present generation DRE's rooted in 1991. The design is based on propriety hard - and firm ware, and is transparent and can be verified and tested by ITA's. The system does not use COTS operating equipment or does not apply COTS application software, of which is known that most COTS software cannot be verified or tested line by line because of there complexity or commercial restraints.

Normally generic standards should describe functionality only, but in this case there should be a distinction between the different types of DRE's. Unfortunately we didn't succeed in convincing the FEC 2002 development group and the IEEE P1583 WG that DRE's with proprietary hardware and proprietary software are regarded as a separate group of DRE's.

Both FEC 2002 and IEEE P1583 Draft 5.3.2 are written with PC or PDA like systems operated by COTS operating systems in mind, with or without touch screens. By some advocacies these system designs initiated the call for a Voter Verifiable Audit trail. This is a step back into the troubles associated with paper voting. Additionally the voting process is made more complex for voters and election staff.

The firm - and hardware development costs for propriety based systems are relatively high. PC based systems are avoiding development risks and are saving money since they use a COTS pc-board as basis (for a cost effective) DRE. However this disregards the extra measures you have to take to get the same security of your end product. Also an important aspect is the lifecycle of a COTS product compared to industrial electronics where legal requirements ask for 15 years+ as a minimum.

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We recommend the EAC to specify a clear definition on groups of voting system designs, making distinction between DRE's using non verifiable COTS for the critical functions of recording and storing cast vote records (CRV) and systems using verifiable transparent designs.

A suggestion for the nomenclature of the groups could be:
Partly Verifiable DRE (PVDRE) and Full Verifiable DRE (FVDRE).
The verification of a FVDRE can be done by an ITA. An ITA can conduct a line by line software check in addition to hardware reliability, - usability, - durability etc tests.

Test methods and conclusions can be made public available in the form of reports. In Europe and in our more than 37 years of experience it has guaranteed voter trust and confidence. This has been and still is the proven and accepted method of testing and certifying DRE systems.

The general public is accustomed to institutions like the FDA, FAA (Federal Aviation Administration) etc. watching over their interests. They trust these institutions and for their money, health and even their lives the public rely on the expertise and integrity of these institutions.

In addition rules for DRE's could include parallel testing on election day, where at random selected DRE's, intended to be applied for actual election, preset votes are cast on the machines under supervision of all parties involved while video taping the action and comparing the final results with preset results. Extensive tests on various systems in California and our system in Ireland conducted by MIT, using this method have proven that the system operates flawless.

Conclusion:
The Voting System Standards should distinguish between voting machines or voting systems using non verifiable COTS for the critical functions of recording and storing cast vote records (CRV) and systems using verifiable transparent designs both in hardware and in software.
The standards could only give functional specifications with an appendix for every identified existing solution giving specific requirements and test rules for that solution. A Voting System Standard structured in such a way gives the users maximum insight and guarantee that the systems perform their tasks in a perfect and desired way and will not block innovation.

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