



FIRST REPORT

of the

Commission on Electronic Voting

on the

**Secrecy, Accuracy and Testing of the
Chosen Electronic Voting System**

AN CHÉAD TUARASCÁIL

ón

gCoimisiún um Vótáil Leictreonach

maidir le

**Rúndacht, Cruinneas agus Tástáil an Chórais
Vótála Leictreonaí atá Roghnaithe**

First Report of the Commission on Electronic Voting

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Foreword

I was greatly honoured when requested by the Government to chair a Commission to advise the Ceann Comhairle on the secrecy and the accuracy of the chosen electronic voting and counting system i.e. the Nedap/Powervote system.

I was also very pleased to have as members of the Commission, Mr. Kieran Coughlan, Clerk of the Dáil, Ms. Deirdre Lane, Clerk of the Seanad, Dr. Danny O'Hare, Chairman of the Information Society Commission and former President of Dublin City University and Mr. Brian Sweeney, Chairman of Siemens Ireland Ltd. and former Chairman of Science Foundation Ireland.

The terms of reference provided that the Commission shall make one or more reports to the Ceann Comhairle not later than 1 May 2004 comprising recommendations on the secrecy and accuracy of the chosen electronic voting and counting system, i.e. the Nedap/Powervote system, including the application or non-application as the case may be of the electronic voting and counting of the Nedap/Powervote system for the local and European elections on 11 June 2004.

The timeframe to complete the first report, which was an interim report, was of necessity very limited so that it was imperative for the Commission to commence its work without delay.

My thanks are due to the many people who assisted the Commission in its work to date particularly those in the University of Dublin, University College Dublin, Dublin City University, the Institute of Public Administration, An Garda Síochána and my colleagues on the Commission.

My thanks are also due to the many people who went to so much trouble to furnish submissions and their views on electronic voting to the Commission.

Since the interim report was presented to the Ceann Comhairle on 30 April 2004, the work of the Commission has been continuing. This has included, inter alia, the development of a programme of software testing in relation to the chosen system.

Finally I must thank the Secretary to the Commission, Mr. Alan Murphy who impressed Commission members by his industry, energy and knowledge of the subject matter. He was ably assisted by Mr. Paul Dowling, Mr. Brendan Conroy, Ms. Anne Quinlan and Ms. Roisin Greene in his work to date.



Mr. Justice Matthew P. Smith
Chairman

15 December, 2004

First Report of the Commission on Electronic Voting

PREFACE

(December 2004)

Background to this Report

This is the report of the Commission on Electronic Voting concerning its work in relation to the chosen electronic voting system carried out between 1 March and 30 April 2004. The Commission has already presented an interim report on 30 April 2004 containing its observations, conclusions and recommendations arising from its work in this period. These remain unchanged in this report.

In making its interim report in April 2004, the Commission indicated that it was unable to present its work in full at that time but that it intended to present it in due course.

Context of Interim Report

The principal constraint applying to the presentation of the Commission's work in full in its interim report was that the original reporting deadline of 1 May 2004 did not allow sufficient time to obtain the views of the various parties identified or mentioned in the work, including the manufacturers of the system.

These parties, including the manufacturers of the system, have been invited to review and comment on the work in the meantime and, where it was found appropriate or necessary, their observations on specific points have been accepted by the Commission and are incorporated in this report.

Any other observations on specific points which were not accepted by the Commission or which did not require to be accommodated (being by way of commentary, additional information or clarification only) have been included at *Appendix 4* to this report.

The observations received in this way address many of the issues raised by contributors to the Commission's report.

Revisions

The revisions to the report arising from this process have not been extensive and have been confined to the elimination of errors and possible misunderstandings. The report has not otherwise been substantially revised or edited other than in matters of style and presentation and thus remains essentially as it stood at the time of presentation of the Commission's interim report in April 2004. In particular, no portion of the report has been either deleted or suppressed.

Contents of Report

The Commission is accordingly presenting the full report of its work at this time (December 2004) as it would have been presented had there been sufficient time to carry out the above mentioned steps at the time of presentation of its interim report in April 2004.

Save as set out above, the contents of this report thus remain subject to the same constraints of time and information as applied to the work at the time it was carried out.

Most importantly, in presenting this report, the Commission has not changed the observations, conclusion and recommendations contained in its interim report.

Context of This Report

In the context of the background to this report as outlined above and the limited revisions that have been made to it, the following should be noted when reading the report:

- the Commission necessarily cast a “wide net” as regards the gathering of information about the chosen system which might be useful to it for the purposes of its work, including certain information which could, strictly speaking, be deemed to be outside its terms of reference;
- the conclusions of contributors to some parts of the work appear, in a small number of cases, to differ from those arising elsewhere: this is because work in relation to various different aspects of the system was carried out by different means, serving different purposes and from different viewpoints;
- in presenting its observations, conclusion and recommendations on the chosen system, the Commission does not necessarily endorse or rely on all of the conclusions arising from the work carried out by contributors to the report but nonetheless considers that they are of value in creating a greater understanding of the chosen system;
- the work presented in this report is based on information available to the Commission at the time of its interim report and does not take account of information coming to light in the meantime;
- the work presented in this report (which also formed the basis of the Commission’s interim report) was done in the particular context of the proposed use of the chosen system at local and European elections and a referendum in June 2004 and references to the June elections throughout the report are to be read accordingly.

The Commission’s observations, conclusion and recommendations as set out in *Part 6* of this report are accordingly presented exactly as they appeared in its interim report in April 2004.

Conclusion (*April 2004*)

The Commission’s overall conclusion in April 2004 on the basis of the work now being presented in this report was that it was unable to recommend the use of the chosen system at the June 2004 elections. It is important to note that this conclusion was not based on any finding that the system would not work but on the finding that it was not proven at that time to the satisfaction of the Commission that it would work.

In fact, it is clear to the Commission that the chosen system is capable of gathering and counting votes at elections with a high degree of accuracy, secrecy and efficiency and this is evident from the results of the tests carried out by the Commission as described in this report.

It is important to note therefore that, insofar as the Commission's overall conclusion may appear to reflect adversely on the chosen system, substantial portions of the Commission's work serve to illustrate and reinforce its positive aspects.

In presenting this full version of the report of its work up to April 2004, the Commission believes, and has endeavoured to ensure, that the work will contribute to the information about the chosen system that is available generally in the context of the public debate.

Further Work of the Commission (*December 2004*)

Following the presentation of its interim report on 30 April 2004, the Commission was placed on a statutory footing by the Electoral (Amendment) Act 2004. The Commission has since been requested by the Government to make such further reports as are necessary concerning the work envisaged by the recommendations of its interim report (as reproduced in section 6.5 of this report).

The Government has also indicated that the Department of the Environment, Heritage and Local Government is establishing a programme of work to address the specific recommendations of the Commission's interim report. The Commission will accordingly review and report on this programme of work, once completed.

The Commission is continuing meanwhile with its own work in relation to the chosen system, particularly as regards that work which could not be undertaken within the constraint of its original reporting timeframe. This has included the process of inviting and considering the views of the various parties mentioned or identified in this report, including the manufacturers of the system.

The Commission is also carrying out new work in relation to matters arising from its interim report. However, rather than seeking to validate or reinforce the Commission's work carried out in the specific context of the June 2004 elections, this new work seeks to build upon the outcome of that work going forward, and includes, in particular, the development of a programme for software assurance and system testing in relation to the chosen system. The Commission has recently invited tenders for the supply of specialist services in this regard.

*Commission on Electronic Voting
15 December 2004*

First Report of the Commission on Electronic Voting

Executive Summary

(December 2004)

Background

This is the first report of the Commission on Electronic Voting concerning its work carried out between 1 March and 30 April 2004. The Commission has previously presented an interim report on 30 April 2004 concerning its work in this period.

The Commission was appointed by the Government on 1 March 2004 to report by 1 May 2004 on the secrecy, accuracy and testing of the electronic voting system chosen for use at elections in Ireland (and as proposed to be used at local and European elections and a referendum in June 2004). The Commission was placed on a statutory footing by the Electoral (Amendment) Act 2004.

In presenting its interim report on 30 April 2004, the Commission indicated that it was unable to present the details of its work in full at that time but that it intended to do so in due course.

Following the presentation of its interim report, the Commission invited the various parties identified or mentioned in its work, including the manufacturers of the system, to review and comment on this full report. The views of these parties on specific points are included in *Appendix 4* to this report and have given rise to some minor changes to the report.

Context of Report

The Commission is presenting this full version of the report of its work now (December 2004) in the same form as it would have been presented at the time of its interim report in April 2004 in the particular context of the proposed use of the system at elections and a referendum in June 2004.

In this context, the Commission has prefaced this report with a number of considerations which should be borne in mind when reading it. Foremost among these considerations is that this is a report of the work carried out in March and April 2004 under significant constraints of time and on the basis of the information available to the Commission at that time.

While this report reflects the broad spectrum of work carried out on behalf of the Commission in this period, the Commission does not necessarily endorse or rely on all of the individual conclusions of its contributors but considers that they are of value in themselves.

The Commission's own observations, conclusion and recommendations arising from its work in this period are presented in this report exactly as they appeared in the interim report.

Work of the Commission *(April 2004)*

The work of the Commission during March and April 2004 included a review of the tests already carried out on the chosen system and the carrying out of further tests on behalf of the Commission. This work is described in *Part 2* of this report.

Individual persons and organisations having expertise in the areas of political science, computer

science, public administration, audit, security and statistics assisted the Commission in its work and their contributions are set out in *Appendix 2* to this report.

Public Submissions

The Commission also invited and received submissions from the public in relation to its work regarding the secrecy, accuracy and testing of the chosen system. The main points arising from the public submissions are reviewed in *Part 3* of this report while the submissions are listed and summarised in *Appendix 3*.

The full texts of the public submissions received are available on the Commission's website *www.cev.ie* and may also be inspected by appointment at the Offices of the Commission during the period of three months following the presentation of this report.

Testing, Accuracy and Secrecy

On the basis of the work and the public submissions described in *Parts 2* and *3*, the Commission's analysis and conclusions in relation to the issues of secrecy, accuracy and testing as contained in its terms of reference are set out in *Parts 4* and *5* of this report.

The Commission's general observations, overall conclusion and recommendations for action are set out in *Part 6*.

Conclusion (*April 2004*)

In its interim report presented on 30 April 2004, the Commission summarised its observations and conclusion in regard to the proposed use of the chosen system at the June 2004 elections as follows:

On the basis of its review of expert reports, submissions received and other relevant information to date, the Commission finds that it is not in a position to recommend with the requisite degree of confidence the use of the chosen system at elections in Ireland in June 2004.

The Commission wishes to emphasise that its conclusion is not based on any finding that the system will not work, but on the finding that it has not been proven at this time to the satisfaction of the Commission that it will work.

In addition, the Commission recognises that the threshold of proof required to support its recommendation against the use of the system is much lower than that which would be required to recommend in its favour. It is for this reason that, although its work is incomplete, the Commission is in a position to make its recommendation within the timeframe of this report.

In that connection, the Commission has not been able to satisfy itself as to the accuracy and secrecy of the system for the following main reasons:

System Testing

The tests of the system carried out to date are insufficient to establish its reliability for use at elections in Ireland in June;

Software Versions

There is not sufficient time before the June elections for a full system testing of the final version of the software that would be necessary before it could be used in these elections and the final version of the software is not available for testing at this point in time;

Source Code

The Commission did not obtain access to the full source code and there is not sufficient time before the June elections to allow a full code review of the final version of the software that would be necessary before it could be used in these elections;

Accuracy

As the software version proposed for use at the forthcoming elections is as yet unknown, it is impossible for anyone to certify its accuracy;

Secrecy

The voting machine “beeps” as preferences are being selected; publication of ballot results in full can allow voters to identify themselves in a context of corruption or intimidation; it may be possible for an insider to overcome the randomness of the method used for the storage of votes in the ballot module.

The Commission accordingly concludes that, having regard to the issues of secrecy, accuracy and testing as set out in its terms of reference, it is unable to recommend the use of the proposed system at the local and European elections and, by extension, at the referendum due to be held on 11 June 2004.

Further Work of the Commission (*December 2004*)

Since the presentation of its interim report in April 2004, the Commission has continued with its work in relation to the chosen system, particularly as regards that work which could not be undertaken within the constraint of its original reporting timeframe. At the request of the Government, the Commission is also carrying out new work in relation to matters arising from its interim report.

The Government has also indicated that the Department of the Environment, Heritage and Local Government is establishing a programme of work to address the specific recommendations of the Commission’s interim report as reproduced in this report. The Commission will also review and report on the Department’s programme of work, once completed.

In addition to the process of inviting and considering the views of the parties mentioned in this report, including the manufacturers of the chosen system, the Commission’s work from the presentation of its interim report in April 2004 up to the presentation of this report in December 2004 has also included the development of a programme for software assurance and system testing in relation to the chosen system. The Commission has recently invited tenders for the supply of specialist services in this regard.

First Report of the Commission on Electronic Voting

Terms of Reference and Membership of Commission¹

(April 2004)

Terms of Reference

- (1) The Commission, which shall be independent in the performance of its functions, shall prepare a number of reports for presentation to the Ceann Comhairle (the Chairman of Dáil Éireann) on the secrecy and accuracy of the chosen electronic voting and counting system i.e. the Powervote/Nedap system.
- (2) The Commission shall make one or more of such reports to the Ceann Comhairle not later than 1 May, 2004 *comprising recommendations on the secrecy and accuracy including the application or non-application as the case may be of the electronic voting and counting of the Powervote/Nedap system for the local and European elections on 11 June, 2004.*
- (3) The Commission's subsequent report or reports will record its views of the operation and experience of electronic voting and counting at elections.
- (4) In carrying out its work, it will be open to the Commission to review the tests already undertaken to validate the electronic voting and counting system and to have further tests undertaken. It may also retain the service of such consultants or other persons that it considers are desirable.
- (5) The Commission shall be entitled to invite and consider submissions on such basis as it thinks appropriate.

[1 March, 2004]²

Membership

The Hon. Mr. Justice Matthew P. Smith
Chairman

Mr. Kieran Coughlan
Clerk of Dáil Éireann

Ms. Deirdre Lane
Clerk of Seanad Éireann

Mr. Danny O'Hare
Chairman of the Information Society Commission and former President of Dublin City University

Mr. Brian Sweeney
Chairman of Siemens Ireland and former Chairman of Science Foundation Ireland

¹ These are the terms of reference of the Commission as they stood at the time of its interim report on 30 April. They have been supplemented by the enactment of the Electoral (Amendment) Act 2004 and by an order of the Government made pursuant thereto on 24 June, 2004. These documents are available on the Commission's website at www.cev.ie.

² The terms of reference of 1 March 2004 were amended on 9 March 2004 as indicated in italics in paragraph (2) above.

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