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Enschede - The Netherlands

The Reliability and Usability of the Nedap Voting Machine

A Pilot Study



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1. Introduction

The University of Twente conducted a pilot study on the reliability and usability of the NEDAP voting machine, which is used for provincial, national and European elections in the Netherlands. The main reason for this study was the Dutch media coverage about potential drawbacks of electronic voting systems (in contrast to the traditional pencil and paper ballots). Discussions about the reliability and usability of voting machines may be resolved using expert analysis of the design specifications of the voting system, but such discussions tend to be inaccessible for the general public. We therefore designed a study that focuses on the actual functioning of the voting machine. Our study has two aims. First, the research will provide a preliminary answer to the question to what extent the current voting machine is reliable and user-friendly. Second, it will serve as a pilot study to estimate the feasibility of this type of research for future elections.

The reliability issue concerns the correspondence between the input and the output of the voting machine. Is the print-out (output) of the voting machine a reliable reproduction of the votes that have been cast by the voters (input)?

The usability issue concerns the question whether voters can easily and effectively cast their vote using the voting machine. Does the voting machine enable voters to cast the vote of their choice? To answer this question, a comparison was made between the voting machine and the traditional (paper and pencil) vote ballot.

In this report, the design and the results of the study are described. Chapter 2 addresses the research method used. The results are presented in chapter 3. In chapter 4, the main conclusions from the study are discussed. These conclusions involve the reliability and usability of the voting machine as well as the design of this type of research.

2. Method

In this chapter, we will first describe the research procedure (2.1). After that, we will briefly discuss the analysis of the results (2.2).

2.1 Research procedure

The research took place on the day of the national elections for the Dutch House of Commons (Tweede Kamer) on November 22, 2006. The town hall of the city of Enschede served as the research location. The polling place located in the same building normally receives about 1500 voters on an election day. But due to the fact that voters are nowadays allowed to choose a polling place of their own choice, the number of voters was considerably higher this election. In total, more than 1800 voters visited the town hall of Enschede to cast their votes. Of this group, 566 people participated in our study (31%). All participants were subject to the following research protocol.

Step 1: Casting the real vote

Participants in our study were people who actually voted on November 22. Posters announcing the research were placed at the entrance of the town hall. The poster stated that the voters would possibly be asked to participate in the study. To avoid interference with real voting behaviour, recruitment of participants started when people left the real voting office.

Step 2: Recruitment

Voters who left the voting office were randomly addressed by a research worker (clearly recognizable as such by a badge) and asked to participate in a study into the user-friendliness of the voting machine and the traditional voting ballot. They were told that the research would only take a few minutes and that six vouchers of € 50 each would be drawn at random among the participants. During the peak hours at the voting office not all voters could be asked for their participation.

Step 3: Research explanation

Voters who agreed to participate in the study were guided to a separate room in the town hall where a voting office was simulated. The participants received a brief explanation of the research. It was explained to them that they had to bring out a vote once more, and that they had to do this using both the voting machine and the traditional voting ballot. It was clearly emphasised that these votes were 'fake' and that the research had nothing to do with the real elections.

Step 4: Voting task

The participants received a form with a participant number and some demographic questions (gender, age, and educational level) which they were asked to fill out afterwards. A researcher instructed the respondent that they would have to cast a vote on a certain candidate. The voting assignment consistently included: (a) the name of the candidate for whom the participant had to vote, (b) the political party to which the candidate belonged, and (c) the number of the candidate on the list of the political party. Translated from Dutch, the instruction was:

You are going to bring out a fake vote. This is for research purposes only. Your vote will not affect the real elections today. We ask you to vote twice, once using the voting machine and once using a traditional voting ballot. Your goal is to vote for [first name plus family name candidate]. This person is number [#] on the list of [name of the political party]. (...) So you are going to vote for [first name plus family name candidate]. This person is number [#] on the list of [name of the political party]. (...) Is this clear? [If no: answer questions or repeat voting assignment.]

Each participant received a different voting task. Participant 2, was asked to vote for the second person on the first list. Participant number 3 for the third person of the first list, and so forth. In this way, all respondents (total number of 566) were given a unique voting task, and all possible voting possibilities were included in the research. After the instructions, participants were guided to the place with the voting machine and the ballots.

Step 5: Voting

The participants were either referred to the voting machine or to the voting ballot. The order of votes (machine versus ballot) was systematically varied, depending on the participant number. The first 25 participants voted on the machine first and used the ballot after that; the next 25 participants voted using ballot first and then used the voting machine, etcetera. To check whether the participants voted correctly on paper, the ballots were marked with participant numbers. To check whether the participants voted correctly using the voting machine, and to compare the input and the output of the voting machine, a small video camera was installed which recorded all participant actions with the voting machine. The camera was unobtrusively placed about 1 metre (3 feet) above the display.

Step 6: End of the session

When the participants had finished the voting procedure, they were asked to fill out and hand in their short form concerning demographic data. If the participants wanted to have chance to win a voucher, they were asked to write their name and address on a separate list.

The entire data collection (including the setting-up of the research facilities, the actual data collection, and the extraction of voting results from the voting machine) took place in the presence of a notary.

2.2 Analysis of the results

To determine the reliability of the voting machine, a comparison was made between the list of voting tasks, the actual voting behaviour on the voting machine (video recording) and the output of the voting machine. To study the usability of the voting machine and the voting ballot, we examined the cases in which participants appeared to deviated from their voting task.

3. Results

In this chapter an overview is given of the composition of the sample (3.1). Then the reliability of the voting machine is discussed (3.2) and also the results concerning the user-friendliness of the voting machine and voting ballot are discussed (3.3).

3.1 Sample

After the voting tasks, the participants had to fill out a form with questions about their gender, age and educational level. Not all participants completed this form, and some participants only completed it partially. Of the 459 participants who completed the question about gender, 56% were male and 44% female. The age of the participants varied from 18 to 89 years old. The average age was 40.3 years old. Tabel 1 presents an overview of the educational level of the participants.

Educational level	Frequency	Percentage
No education	7	1%
Primary school	13	2%
LTS, LEAO, LHNO VMBO	19	3%
MAVO, (M)ULO, VMBO-t	51	9%
MBO, MTS, MEAO, BOL	57	10%
HAVO, VWO, HBS, MMS	38	7%
HBO, HTS, HEAO	172	30%
University	169	30%
Unknown	40	7%
Total	566	100%

Table 1. Educational level of the participants

3.2 Reliability of the voting machine

Using the video camera recordings, it was possible to compare actual machine input with machine output. In Appendix 1, a full list is included comparing the input and output. There appeared to be a 100% correspondence between the votes that were cast by the participants and the election result produced by the voting machine. Based on these findings, the voting machine can be labelled as entirely reliable.

3.3 Usability of the voting machine and the ballot

In 29 of all 566 cases (5%) a deviation between voting task and actual vote occurred. The types of error and the causes differ however and are not all practically meaningful. In table 2, all deviations are presented, along with a brief explanation.

NO.	TARGET	BALLOT	COR	MACH	COR	MISTAKE	ORDER
8	1,08	8,01	0	8,01	0	Personal mistake participant	Machine-Ballot
13	1,13	1,01	0	1,01	0	Personal mistake participant	Machine-Ballot
29	1,29	1,01	0	1,01	0	Personal mistake participant	Ballot-Machine
35	1,35	1,34	0	1,35	1	Interface ballot	Ballot-Machine
36	1,36	1,36	1	nothing	0	Research problem	Ballot-Machine
46	1,46	2,46	0	1,46	1	Interface ballot	Ballot-Machine
48	1,48	1,48	1	1,28	0	Research problem	Ballot-Machine
64	1,64	1,01	0	1,01	0	Personal mistake participant	Machine-Ballot
68	1,68	2,68	0	1,68	1	Interface ballot	Machine-Ballot
71	1,71	2,1	0	2,1	0	Personal mistake participant	Machine-Ballot
76	2,02	stopped	0	stopped	0	Research problem	Ballot-Machine
80	2,06	2,06	1	2,05	0	Interface machine	Ballot-Machine
83	2,09	4,01	0	4,01	0	Personal mistake participant	Ballot-Machine
96	2,22	2,22	1	3,22	0	Interface machine	Ballot-Machine
97	2,23	2,23	1	3,23	0	Interface machine	Ballot-Machine
129	2,55	1,55	0	1,55	0	Interface ballot and machine	Ballot-Machine
147	2,73	2,73	1	2,74	0	Personal mistake participant	Ballot-Machine
192	3,38	3,38	1	4,01	0	Interface machine	Ballot-Machine
251	5,11	5,12	0	5,12	0	Research problem	Machine-Ballot
267	5,27	5,27	1	5,24	0	Interface machine	Machine-Ballot
277	6,09	6,08	0	9,09	0	Personal mistake participant	Ballot-Machine
302	7,04	4,01	0	4,01	0	Personal mistake participant	Machine-Ballot
332	8,04	6,04	0	6,04	0	Personal mistake participant	Ballot-Machine
351	8,23	13,01	0	13,01	0	Personal mistake participant	Machine-Ballot
395	10,08	10,08	1	10,09	0	Interface machine	Ballot-Machine
415	11,16	11,04	0	15,04	0	Personal mistake participant	Machine-Ballot
427	11,28	nothing	0	7,06	0	Personal mistake participant	Ballot-Machine
489	14,11	14,13	0	14,11	1	Interface ballot	Ballot-Machine
511	16,02	16,02	1	16,01	0	Interface machine	Machine-Ballot

Table 2. All voting situations where a deviation occurred

Note: Column 1 [NO] contains the participant number. Column 2 [TARGET] presents the voting task (1.08 stands for candidate #8 on list 1—CDA). Column 3 [BALLOT] and 5 [MACH], respectively, show the actual vote of the participant in the paper-ballot and the voting-machine condition. Column 4 and 6 [COR] indicate whether the votes were correct (1) or incorrect (0). Column 7 [MISTAKE] provides a brief indication of the possible cause of the deviation. Column 8 [ORDER] contains the order in which participants had voted (first the voting machine and then the paper ballot, or the other way around).

1. Personal mistakes of the participants (13 times)

By far, most deviations must be attributed to personal mistakes by the participants. These participants had difficulties remembering their voting task and as a result of this they voted on another candidate. An indicator for this type of errors was the consistency between the deviation on the voting ballot and the voting machine (participants made the same mistake twice) and the distance between the voting task and the actual vote (the mistake could not be attributed to the incorrect reading of the rows or columns). In five cases, the participants seemed to vote on the party of their preference (as voted 10 minutes before the research for the real election): the vote had nothing to do with the voting task (participants 71, 83, 302, 332 and 351). In three cases, the participants consistently voted on the first candidate of the list, and forgot to vote on a candidate lower on the list (participants 13, 29 and 64). In two cases the participants seemed to vote on random candidates who had nothing to do with the voting task (participants 277 and 415). In one case, the participant appeared to mix up the list number and the candidate number: instead of number 8 of list 1, this participant voted for number 1 of list 8 (participant 8). In one case, a verbalisation of the participant (on the camera recording) made clear that the participant had forgotten the candidate number: on paper, the respondent correctly voted for number 73 of list 2; before using the voting machine, the participant said that he had to vote for number 74 of the same list (participant 147). Finally, a seriously disabled person had difficulties with both manners of voting: on paper he did not succeed at all, while on the voting machine he only managed to cast a random vote (participant 427).

2. Research problems (4 times)

Four of the deviations found must be attributed to various aspects of the research setting. The video recordings showed that one of the participants casted a vote with the voting machine, which was not stored (participant 36). This happened because the voting machine was not released by one of the research assistants. Another problem occurred due to a difference in length between the lists on the ballot and on the voting machine. When voting using the ballot, one participant noticed that his candidate was located in the first column, on third place from below. He took the same strategy using the voting machine, not noticing that the candidate was someone else (participant 48). Another participant refused to vote both using the ballot and using the voting machine (participant 76). Finally,

one participant voted wrong twice, because he was misled by an erroneous voting instruction by the present notary.

3. Deviations as a possible consequence of the lay-out of the voting ballot (5 times)

Some deviations may be attributed to the lay-out of the voting ballot. In four cases, participants who voted correctly using the voting machine, made a mistake on the voting ballot (participants 35, 46, 68 and 489). They all appeared to misread a column or a row. Three of them probably did not make their mistake due to memory problems, as they voted wrongly at their first vote using the ballot, and after that voted correctly using the voting machine. In one case a participant made a mistake in a column both with the ballot and with the voting machine (participant 129).

4. Deviation as a possible consequence of the interface of the voting machine (8 times)

Some deviations with the voting machine may have also been caused by the interface of the machine panel. With the exception of participant 129 (as mentioned above), who casted both votes wrongly, these participants voted correct on the ballot, but made a mistake when using the voting machine (participants 80, 96, 97, 192, 267, 395 and 511). Five of these participants voted (correctly) on the ballot first and then incorrectly on the voting machine. Their problems might be caused by memory problems. The other two made a mistake using the voting machine first, and after that voted correctly on the ballot.

In all, it can be said that no serious problems have arisen with the voting computer and the voting ballot. When personal errors of participants and research problems are set aside, usability problems occurred with the voting ballot in five of the 566 cases (0.9%) With the voting machine, problems occurred in eight of the 566 cases (1.4%). With these small numbers, statistical comparisons of the two types of voting appear to be irrelevant. The same applies to an analysis of the influence of voter or context characteristics on usability problems.

4. Conclusions

4.1 Conclusions about the Nedap voting machine

- The output of the Nedap voting machine fully corresponds with the input. For the 566 casted votes it can be concluded that the voting machine is 100% reliable.
- There are few usability problems with the voting machine and the traditional voting ballot. When personal mistakes and research problems are set aside, both types of voting caused usability problems for about 1% of all participants.
- In all, the voting machine appears to be the better option of the two, since the machine output is final, in contrast to paper ballots, which have to be counted manually afterwards.

4.2 Conclusions about the design of the study

- Research like the study reported here may help to monitor the reliability and usability of the voting machine, and to address societal concerns about electronic voting in an insightful way.
- For such a monitoring function, it is important that (a) the research is conducted on a larger scale, and (b) the voting machines included in the test are randomly selected from all voting machines available.
- Voters appear to be willing to participate in this type of research.
- Regarding practical implementation attention must be paid to:
 - A sufficient number of research assistants: 1 or 2 for the recruitment of participants, 4 for the execution of the research.
 - Careful and solid placement of the camera. A digital camera (connected to a laptop) is preferred.
 - A smaller and more quiet research room.

Appendices

Appendix 1. Reliability voting machine (comparison INPUT-OUTPUT)
Appendix 2. Results of all participants.

Appendix 1. Reliability voting machine

Comparison between INPUT and OUTPUT of the voting machine

TARGET	THEOR-OUTPUT	MACHINE-INPUT	MACHINE-OUTPUT	INPUT = OUTPUT
1.01	1	4	4	1
1.02	1	1	1	1
1.03	1	1	1	1
1.04	1	1	1	1
1.05	1	1	1	1
1.06	1	1	1	1
1.07	1	1	1	1
1.08	1	0	0	1
1.09	1	1	1	1
1.1	1	1	1	1
1.11	1	1	1	1
1.12	1	1	1	1
1.13	1	0	0	1
1.14	1	1	1	1
1.15	1	1	1	1
1.16	1	1	1	1
1.17	1	1	1	1
1.18	1	1	1	1
1.19	1	1	1	1
1.2	1	1	1	1
1.21	1	1	1	1
1.22	1	1	1	1
1.23	1	1	1	1
1.24	1	1	1	1
1.25	1	1	1	1
1.26	1	1	1	1
1.27	1	1	1	1
1.28	1	2	2	1
1.29	1	0	0	1
1.3	1	1	1	1
1.31	1	1	1	1
1.32	1	1	1	1
1.33	1	1	1	1
1.34	1	1	1	1
1.35	1	1	1	1
1.36	1	0	0	1
1.37	1	1	1	1
1.38	1	1	1	1
1.39	1	1	1	1
1.4	1	1	1	1
1.41	1	1	1	1
1.42	1	1	1	1
1.43	1	1	1	1
1.44	1	1	1	1
1.45	1	1	1	1
1.46	1	1	1	1
1.47	1	1	1	1
1.48	1	0	0	1
1.49	1	1	1	1
1.5	1	1	1	1
1.51	1	1	1	1
1.52	1	1	1	1
1.53	1	1	1	1
1.54	1	1	1	1
1.55	1	2	2	1
1.56	1	1	1	1
1.57	1	1	1	1
1.58	1	1	1	1
1.59	1	1	1	1
1.6	1	1	1	1
1.61	1	1	1	1
1.62	1	1	1	1
1.63	1	1	1	1
1.64	1	0	0	1
1.65	1	1	1	1
1.66	1	1	1	1
1.67	1	1	1	1
1.68	1	1	1	1
1.69	1	1	1	1
1.7	1	1	1	1
1.71	1	0	0	1
1.72	1	1	1	1
1.73	1	1	1	1
1.74	1	1	1	1

2.01	1	2	2	1
2.02	1	0	0	1
2.03	1	1	1	1
2.04	1	1	1	1
2.05	1	2	2	1
2.06	1	0	0	1
2.07	1	1	1	1
2.08	1	1	1	1
2.09	1	0	0	1
2.1	1	1	1	1
2.11	1	1	1	1
2.12	1	1	1	1
2.13	1	1	1	1
2.14	1	1	1	1
2.15	1	1	1	1
2.16	1	1	1	1
2.17	1	1	1	1
2.18	1	1	1	1
2.19	1	1	1	1
2.2	1	1	1	1
2.21	1	1	1	1
2.22	1	0	0	1
2.23	1	0	0	1
2.24	1	1	1	1
2.25	1	1	1	1
2.26	1	1	1	1
2.27	1	1	1	1
2.28	1	1	1	1
2.29	1	1	1	1
2.3	1	1	1	1
2.31	1	1	1	1
2.32	1	1	1	1
2.33	1	1	1	1
2.34	1	1	1	1
2.35	1	1	1	1
2.36	1	1	1	1
2.37	1	1	1	1
2.38	1	1	1	1
2.39	1	1	1	1
2.4	1	1	1	1
2.41	1	1	1	1
2.42	1	1	1	1
2.43	1	1	1	1
2.44	1	1	1	1
2.45	1	1	1	1
2.46	1	1	1	1
2.47	1	1	1	1
2.48	1	1	1	1
2.49	1	1	1	1
2.5	1	1	1	1
2.51	1	1	1	1
2.52	1	1	1	1
2.53	1	1	1	1
2.54	1	1	1	1
2.55	1	0	0	1
2.56	1	1	1	1
2.57	1	1	1	1
2.58	1	1	1	1
2.59	1	1	1	1
2.6	1	1	1	1
2.61	1	1	1	1
2.62	1	1	1	1
2.63	1	1	1	1
2.64	1	1	1	1
2.65	1	1	1	1
2.66	1	1	1	1
2.67	1	1	1	1
2.68	1	1	1	1
2.69	1	1	1	1
2.7	1	1	1	1
2.71	1	1	1	1
2.72	1	1	1	1
2.73	1	0	0	1
2.74	1	2	2	1
2.75	1	1	1	1
2.76	1	1	1	1
2.77	1	1	1	1
2.78	1	1	1	1

2.79	1	1	1	1
2.8	1	1	1	1
3.01	1	1	1	1
3.02	1	1	1	1
3.03	1	1	1	1
3.04	1	1	1	1
3.05	1	1	1	1
3.06	1	1	1	1
3.07	1	1	1	1
3.08	1	1	1	1
3.09	1	1	1	1
3.1	1	1	1	1
3.11	1	1	1	1
3.12	1	1	1	1
3.13	1	1	1	1
3.14	1	1	1	1
3.15	1	1	1	1
3.16	1	1	1	1
3.17	1	1	1	1
3.18	1	1	1	1
3.19	1	1	1	1
3.2	1	1	1	1
3.21	1	1	1	1
3.22	1	2	2	1
3.23	1	2	2	1
3.24	1	1	1	1
3.25	1	1	1	1
3.26	1	1	1	1
3.27	1	1	1	1
3.28	1	1	1	1
3.29	1	1	1	1
3.3	1	1	1	1
3.31	1	1	1	1
3.32	1	1	1	1
3.33	1	1	1	1
3.34	1	1	1	1
3.35	1	1	1	1
3.36	1	1	1	1
3.37	1	1	1	1
3.38	1	0	0	1
3.39	1	1	1	1
3.4	1	1	1	1
3.41	1	1	1	1
3.42	1	1	1	1
3.43	1	1	1	1
3.44	1	1	1	1
3.45	1	1	1	1
3.46	1	1	1	1
3.47	1	1	1	1
3.48	1	1	1	1
3.49	1	1	1	1
3.5	1	1	1	1
3.51	1	1	1	1
3.52	1	1	1	1
3.53	1	1	1	1
3.54	1	1	1	1
3.55	1	1	1	1
3.56	1	1	1	1
4.01	1	4	4	1
4.02	1	1	1	1
4.03	1	1	1	1
4.04	1	1	1	1
4.05	1	1	1	1
4.06	1	1	1	1
4.07	1	1	1	1
4.08	1	1	1	1
4.09	1	1	1	1
4.1	1	1	1	1
4.11	1	1	1	1
4.12	1	1	1	1
4.13	1	1	1	1
4.14	1	1	1	1
4.15	1	1	1	1
4.16	1	1	1	1
4.17	1	1	1	1

4.18	1	1	1	1
4.19	1	1	1	1
4.2	1	1	1	1
4.21	1	1	1	1
4.22	1	1	1	1
4.23	1	1	1	1
4.24	1	1	1	1
4.25	1	1	1	1
4.26	1	1	1	1
4.27	1	1	1	1
4.28	1	1	1	1
4.29	1	1	1	1
4.3	1	1	1	1
5.01	1	1	1	1
5.02	1	1	1	1
5.03	1	1	1	1
5.04	1	1	1	1
5.05	1	1	1	1
5.06	1	1	1	1
5.07	1	1	1	1
5.08	1	1	1	1
5.09	1	1	1	1
5.1	1	1	1	1
5.11	1	0	0	1
5.12	1	2	2	1
5.13	1	1	1	1
5.14	1	1	1	1
5.15	1	1	1	1
5.16	1	1	1	1
5.17	1	1	1	1
5.18	1	1	1	1
5.19	1	1	1	1
5.2	1	1	1	1
5.21	1	1	1	1
5.22	1	1	1	1
5.23	1	1	1	1
5.24	1	2	2	1
5.25	1	1	1	1
5.26	1	1	1	1
5.27	1	0	0	1
5.28	1	1	1	1
6.01	1	1	1	1
6.02	1	1	1	1
6.03	1	1	1	1
6.04	1	2	2	1
6.05	1	1	1	1
6.06	1	1	1	1
6.07	1	1	1	1
6.08	1	1	1	1
6.09	1	0	0	1
6.1	1	1	1	1
6.11	1	1	1	1
6.12	1	1	1	1
6.13	1	1	1	1
6.14	1	1	1	1
6.15	1	1	1	1
6.16	1	1	1	1
6.17	1	1	1	1
6.18	1	1	1	1
6.19	1	1	1	1
6.2	1	1	1	1
6.21	1	1	1	1
6.22	1	1	1	1
6.23	1	1	1	1
6.24	1	1	1	1
6.25	1	1	1	1
6.26	1	1	1	1
6.27	1	1	1	1
6.28	1	1	1	1
6.29	1	1	1	1
6.3	1	1	1	1
7.01	1	1	1	1
7.02	1	1	1	1
7.03	1	1	1	1
7.04	1	0	0	1

7.05	1	1	1	
7.06	1	2	2	
7.07	1	1	1	
7.08	1	1	1	
7.09	1	1	1	
7.1	1	1	1	
7.11	1	1	1	
7.12	1	1	1	
7.13	1	1	1	
7.14	1	1	1	
7.15	1	1	1	
7.16	1	1	1	
7.17	1	1	1	
7.18	1	1	1	
7.19	1	1	1	
7.2	1	1	1	
7.21	1	1	1	
7.22	1	1	1	
7.23	1	1	1	
7.24	1	1	1	
7.25	1	1	1	
7.26	1	1	1	
7.27	1	1	1	
7.28	1	1	1	
7.29	1	1	1	
7.3	1	1	1	
8.01	1	2	2	
8.02	1	1	1	
8.03	1	1	1	
8.04	1	0	0	
8.05	1	1	1	
8.06	1	1	1	
8.07	1	1	1	
8.08	1	1	1	
8.09	1	1	1	
8.1	1	1	1	
8.11	1	1	1	
8.12	1	1	1	
8.13	1	1	1	
8.14	1	1	1	
8.15	1	1	1	
8.16	1	1	1	
8.17	1	1	1	
8.18	1	1	1	
8.19	1	1	1	
8.2	1	1	1	
8.21	1	1	1	
8.22	1	1	1	
8.23	1	0	0	
8.24	1	1	1	
8.25	1	1	1	
8.26	1	1	1	
8.27	1	1	1	
8.28	1	1	1	
8.29	1	1	1	
9.01	1	1	1	
9.02	1	1	1	
9.03	1	1	1	
9.04	1	1	1	
9.05	1	1	1	
9.06	1	1	1	
9.07	1	1	1	
9.08	1	1	1	
9.09	1	2	2	
9.1	1	1	1	
9.11	1	1	1	
9.12	1	1	1	
9.13	1	1	1	
9.14	1	1	1	
9.15	1	1	1	
9.16	1	1	1	
9.17	1	1	1	

9.18	1	1	1
9.19	1	1	1
9.2	1	1	1
9.21	1	1	1
9.22	1	1	1
9.23	1	1	1
9.24	1	1	1
9.25	1	1	1
9.26	1	1	1
9.27	1	1	1
9.28	1	1	1
9.29	1	1	1
9.3	1	1	1
10.01	1	1	1
10.02	1	1	1
10.03	1	1	1
10.04	1	1	1
10.05	1	1	1
10.06	1	1	1
10.07	1	1	1
10.08	1	0	0
10.09	1	2	2
10.1	1	1	1
10.11	1	1	1
10.12	1	1	1
11.01	1	1	1
11.02	1	1	1
11.03	1	1	1
11.04	1	1	1
11.05	1	1	1
11.06	1	1	1
11.07	1	1	1
11.08	1	1	1
11.09	1	1	1
11.1	1	1	1
11.11	1	1	1
11.12	1	1	1
11.13	1	1	1
11.14	1	1	1
11.15	1	1	1
11.16	1	0	0
11.17	1	1	1
11.18	1	1	1
11.19	1	1	1
11.2	1	1	1
11.21	1	1	1
11.22	1	1	1
11.23	1	1	1
11.24	1	1	1
11.25	1	1	1
11.26	1	1	1
11.27	1	1	1
11.28	1	0	0
11.29	1	1	1
12.01	1	1	1
12.02	1	1	1
12.03	1	1	1
12.04	1	1	1
12.05	1	1	1
12.06	1	1	1
12.07	1	1	1
12.08	1	1	1
12.09	1	1	1
12.1	1	1	1
12.11	1	1	1
12.12	1	1	1
12.13	1	1	1
12.14	1	1	1
12.15	1	1	1
12.16	1	1	1
12.17	1	1	1
12.18	1	1	1
12.19	1	1	1
12.2	1	1	1
12.21	1	1	1

12.22	1	1	1
12.23	1	1	1
12.24	1	1	1
12.25	1	1	1
12.26	1	1	1
12.27	1	1	1
12.28	1	1	1
12.29	1	1	1
12.3	1	1	1
13.01	1	2	2
13.02	1	1	1
13.03	1	1	1
13.04	1	1	1
13.05	1	1	1
13.06	1	1	1
13.07	1	1	1
13.08	1	1	1
13.09	1	1	1
13.1	1	1	1
13.11	1	1	1
13.12	1	1	1
13.13	1	1	1
13.14	1	1	1
13.15	1	1	1
13.16	1	1	1
13.17	1	1	1
13.18	1	1	1
13.19	1	1	1
13.2	1	1	1
14.01	1	1	1
14.02	1	1	1
14.03	1	1	1
14.04	1	1	1
14.05	1	1	1
14.06	1	1	1
14.07	1	1	1
14.08	1	1	1
14.09	1	1	1
14.1	1	1	1
14.11	1	1	1
14.12	1	1	1
14.13	1	1	1
14.14	1	1	1
14.15	1	1	1
14.16	1	1	1
14.17	1	1	1
14.18	1	1	1
14.19	1	1	1
14.2	1	1	1
14.21	1	1	1
14.22	1	1	1
14.23	1	1	1
14.24	1	1	1
14.25	1	1	1
15.01	1	1	1
15.02	1	1	1
15.03	1	1	1
15.04	1	2	2
15.05	1	1	1
15.06	1	1	1
16.01	1	2	2
16.02	1	0	0
16.03	1	1	1
16.04	1	1	1
16.05	1	1	1
16.06	1	1	1
16.07	1	1	1
16.08	1	1	1
16.09	1	1	1
16.1	1	1	1
16.11	1	1	1
16.12	1	1	1
16.13	1	1	1
16.14	1	1	1
17.01	1	1	1

17.02	1	1	1	1
17.03	1	1	1	1
17.04	1	1	1	1
17.05	1	1	1	1
17.06	1	1	1	1
17.07	1	1	1	1
17.08	1	1	1	1
17.09	1	1	1	1
17.1	1	1	1	1
17.11	1	1	1	1
17.12	1	1	1	1
17.13	1	1	1	1
17.14	1	1	1	1
17.15	1	1	1	1
17.16	1	1	1	1
17.17	1	1	1	1
17.18	1	1	1	1
17.19	1	1	1	1
17.2	1	1	1	1
17.21	1	1	1	1
17.22	1	1	1	1
17.23	1	1	1	1
17.24	1	1	1	1
17.25	1	1	1	1
17.26	1	1	1	1
17.27	1	1	1	1
18.01	1	1	1	1
18.02	1	1	1	1
18.03	1	1	1	1
18.04	1	1	1	1
18.05	1	1	1	1
18.06	1	1	1	1
18.07	1	1	1	1
18.08	1	1	1	1
18.09	1	1	1	1
18.1	1	1	1	1
19.01	1	1	1	1
19.02	1	1	1	1
19.03	1	1	1	1
19.04	1	1	1	1
19.05	1	1	1	1
19.06	1	1	1	1
RELIABILITY				1

Appendix 2. Results of all participants

Comparison between assigned and casted votes (voting ballot and voting machine)

PART.NO.	TARGET	BALLOT CORRECT	MACHINE CORRECT	MISTAKE	ORDER	
1	1.01	1.01	1	1.01	1	Machine first
2	1.02	1.02	1	1.02	1	Machine first
3	1.03	1.03	1	1.03	1	Machine first
4	1.04	1.04	1	1.04	1	Machine first
5	1.05	1.05	1	1.05	1	Machine first
6	1.06	1.06	1	1.06	1	Machine first
7	1.07	1.07	1	1.07	1	Machine first
8	1.08	8.01	0	8.01	0	Tape 1 16:40 Personal mistake participant
9	1.09	1.09	1	1.09	1	Machine first
10	1.1	1.1	1	1.1	1	Machine first
11	1.11	1.11	1	1.11	1	Machine first
12	1.12	1.12	1	1.12	1	Machine first
13	1.13	1.01	0	1.01	0	Tape 1 21:30 Personal mistake participant
14	1.14	1.14	1	1.14	1	Machine first
15	1.15	1.15	1	1.15	1	Machine first
16	1.16	1.16	1	1.16	1	Machine first
17	1.17	1.17	1	1.17	1	Machine first
18	1.18	1.18	1	1.18	1	Machine first
19	1.19	1.19	1	1.19	1	Machine first
20	1.2	1.2	1	1.2	1	Machine first
21	1.21	1.21	1	1.21	1	Machine first
22	1.22	1.22	1	1.22	1	Machine first
23	1.23	1.23	1	1.23	1	Machine first
24	1.24	1.24	1	1.24	1	Machine first
25	1.25	1.25	1	1.25	1	Ballot first
26	1.26	1.26	1	1.26	1	Ballot first
27	1.27	1.27	1	1.27	1	Ballot first
28	1.28	1.28	1	1.28	1	Ballot first
29	1.29	1.01	0	1.01	0	Tape 1 42:30 Personal mistake participant
30	1.3	1.3	1	1.3	1	Ballot first
31	1.31	1.31	1	1.31	1	Ballot first
32	1.32	1.32	1	1.32	1	Ballot first
33	1.33	1.33	1	1.33	1	Ballot first
34	1.34	1.34	1	1.34	1	Ballot first
35	1.35	1.34	0	1.35	1	Interface ballot
36	1.36	1.36	1	niets	0	Tape 1 7:40 Research problem
37	1.37	1.37	1	1.37	1	Ballot first
38	1.38	1.38	1	1.38	1	Ballot first
39	1.39	1.39	1	1.39	1	Ballot first
40	1.4	1.4	1	1.4	1	Ballot first
41	1.41	1.41	1	1.41	1	Ballot first
42	1.42	1.42	1	1.42	1	Ballot first
43	1.43	1.43	1	1.43	1	Ballot first
44	1.44	1.44	1	1.44	1	Ballot first
45	1.45	1.45	1	1.45	1	Ballot first
46	1.46	2.46	0	1.46	1	Interface ballot
47	1.47	1.47	1	1.47	1	Ballot first
48	1.48	1.48	1	1.28	0	Tape 2 20:10 Research problem
49	1.49	1.49	1	1.49	1	Ballot first
50	1.5	1.5	1	1.5	1	Machine first
51	1.51	1.51	1	1.51	1	Machine first
52	1.52	1.52	1	1.52	1	Machine first
53	1.53	1.53	1	1.53	1	Machine first
54	1.54	1.54	1	1.54	1	Machine first
55	1.55	1.55	1	1.55	1	Machine first
56	1.56	1.56	1	1.56	1	Machine first
57	1.57	1.57	1	1.57	1	Machine first
58	1.58	1.58	1	1.58	1	Machine first
59	1.59	1.59	1	1.59	1	Machine first
60	1.6	1.6	1	1.6	1	Machine first
61	1.61	1.61	1	1.61	1	Machine first
62	1.62	1.62	1	1.62	1	Machine first
63	1.63	1.63	1	1.63	1	Machine first
64	1.64	1.01	0	1.01	0	Personal mistake participant
65	1.65	1.65	1	1.65	1	Machine first
66	1.66	1.66	1	1.66	1	Machine first
67	1.67	1.67	1	1.67	1	Machine first
68	1.68	2.68	0	1.68	1	Interface ballot
69	1.69	1.69	1	1.69	1	Machine first
70	1.7	1.7	1	1.7	1	Machine first
71	1.71	2.01	0	2.01	0	Tape 3 11:20 Personal mistake participant
72	1.72	1.72	1	1.72	1	Machine first
73	1.73	1.73	1	1.73	1	Machine first
74	1.74	1.74	1	1.74	1	Machine first

75	2.01	2.01	1	2.01	1		Ballot first
76	2.02	gestopt	0	gestopt	0	Research problem	Ballot first
77	2.03	2.03	1	2.03	1		Ballot first
78	2.04	2.04	1	2.04	1		Ballot first
79	2.05	2.05	1	2.05	1		Ballot first
80	2.06	2.06	1	2.05	0	Interface machine	Ballot first
81	2.07	2.07	1	2.07	1		Ballot first
82	2.08	2.08	1	2.08	1		Ballot first
83	2.09	4.01	0	4.01	0	Tape 3 28:20 Personal mistake participant	Ballot first
84	2.1	2.1	1	2.1	1		Ballot first
85	2.11	2.11	1	2.11	1		Ballot first
86	2.12	2.12	1	2.12	1		Ballot first
87	2.13	2.13	1	2.13	1		Ballot first
88	2.14	2.14	1	2.14	1		Ballot first
89	2.15	2.15	1	2.15	1		Ballot first
90	2.16	2.16	1	2.16	1		Ballot first
91	2.17	2.17	1	2.17	1		Ballot first
92	2.18	2.18	1	2.18	1		Ballot first
93	2.19	2.19	1	2.19	1		Ballot first
94	2.2	2.2	1	2.2	1		Ballot first
95	2.21	2.21	1	2.21	1		Ballot first
96	2.22	2.22	1	3.22	0	Tape 3 40: 30 Interface machine	Ballot first
97	2.23	2.23	1	3.23	0	Tape 3 41 Interface machine	Ballot first
98	2.24	2.24	1	2.24	1		Ballot first
99	2.25	2.25	1	2.25	1		Ballot first
100	2.26	2.26	1	2.26	1		Machine first
101	2.27	2.27	1	2.27	1		Machine first
102	2.28	2.28	1	2.28	1		Machine first
103	2.29	2.29	1	2.29	1		Machine first
104	2.3	2.3	1	2.3	1		Machine first
105	2.31	2.31	1	2.31	1		Machine first
106	2.32	2.32	1	2.32	1		Machine first
107	2.33	2.33	1	2.33	1		Machine first
108	2.34	2.34	1	2.34	1		Machine first
109	2.35	2.35	1	2.35	1		Machine first
110	2.36	2.36	1	2.36	1		Machine first
111	2.37	2.37	1	2.37	1		Machine first
112	2.38	2.38	1	2.38	1		Machine first
113	2.39	2.39	1	2.39	1		Machine first
114	2.4	2.4	1	2.4	1		Machine first
115	2.41	2.41	1	2.41	1		Machine first
116	2.42	2.42	1	2.42	1		Machine first
117	2.43	2.43	1	2.43	1		Machine first
118	2.44	2.44	1	2.44	1		Machine first
119	2.45	2.45	1	2.45	1		Machine first
120	2.46	2.46	1	2.46	1		Machine first
121	2.47	2.47	1	2.47	1		Machine first
122	2.48	2.48	1	2.48	1		Machine first
123	2.49	2.49	1	2.49	1		Machine first
124	2.5	2.5	1	2.5	1		Ballot first
125	2.51	2.51	1	2.51	1		Ballot first
126	2.52	2.52	1	2.52	1		Ballot first
127	2.53	2.53	1	2.53	1		Ballot first
128	2.54	2.54	1	2.54	1		Ballot first
129	2.55	1.55	0	1.55	0	Tape 4 23:40 Interface ballot en machine	Ballot first
130	2.56	2.56	1	2.56	1		Ballot first
131	2.57	2.57	1	2.57	1		Ballot first
132	2.58	2.58	1	2.58	1		Ballot first
133	2.59	2.59	1	2.59	1		Ballot first
134	2.6	2.6	1	2.6	1		Ballot first
135	2.61	2.61	1	2.61	1		Ballot first
136	2.62	2.62	1	2.62	1		Ballot first
137	2.63	2.63	1	2.63	1		Ballot first
138	2.64	2.64	1	2.64	1		Ballot first
139	2.65	2.65	1	2.65	1		Ballot first
140	2.66	2.66	1	2.66	1		Ballot first
141	2.67	2.67	1	2.67	1		Ballot first
142	2.68	2.68	1	2.68	1		Ballot first
143	2.69	2.69	1	2.69	1		Ballot first
144	2.7	2.7	1	2.7	1		Ballot first
145	2.71	2.71	1	2.71	1		Ballot first
146	2.72	2.72	1	2.72	1		Ballot first
147	2.73	2.73	1	2.74	0	Tape 4 55:20 Personal mistake participant	Ballot first
148	2.74	2.74	1	2.74	1		Ballot first
149	2.75	2.75	1	2.75	1		Machine first

150	2.76	2.76	1	2.76	1	Machine first
151	2.77	2.77	1	2.77	1	Machine first
152	2.78	2.78	1	2.78	1	Machine first
153	2.79	2.79	1	2.79	1	Machine first
154	2.8	2.8	1	2.8	1	Machine first
155	3.01	3.01	1	3.01	1	Machine first
156	3.02	3.02	1	3.02	1	Machine first
157	3.03	3.03	1	3.03	1	Machine first
158	3.04	3.04	1	3.04	1	Machine first
159	3.05	3.05	1	3.05	1	Machine first
160	3.06	3.06	1	3.06	1	Machine first
161	3.07	3.07	1	3.07	1	Machine first
162	3.08	3.08	1	3.08	1	Machine first
163	3.09	3.09	1	3.09	1	Machine first
164	3.1	3.1	1	3.1	1	Machine first
165	3.11	3.11	1	3.11	1	Machine first
166	3.12	3.12	1	3.12	1	Machine first
167	3.13	3.13	1	3.13	1	Machine first
168	3.14	3.14	1	3.14	1	Machine first
169	3.15	3.15	1	3.15	1	Machine first
170	3.16	3.16	1	3.16	1	Machine first
171	3.17	3.17	1	3.17	1	Machine first
172	3.18	3.18	1	3.18	1	Machine first
173	3.19	3.19	1	3.19	1	Machine first
174	3.2	3.2	1	3.2	1	Ballot first
175	3.21	3.21	1	3.21	1	Ballot first
176	3.22	3.22	1	3.22	1	Ballot first
177	3.23	3.23	1	3.23	1	Ballot first
178	3.24	3.24	1	3.24	1	Ballot first
179	3.25	3.25	1	3.25	1	Ballot first
180	3.26	3.26	1	3.26	1	Ballot first
181	3.27	3.27	1	3.27	1	Ballot first
182	3.28	3.28	1	3.28	1	Ballot first
183	3.29	3.29	1	3.29	1	Ballot first
184	3.3	3.3	1	3.3	1	Ballot first
185	3.31	3.31	1	3.31	1	Ballot first
186	3.32	3.32	1	3.32	1	Ballot first
187	3.33	3.33	1	3.33	1	Ballot first
188	3.34	3.34	1	3.34	1	Ballot first
189	3.35	3.35	1	3.35	1	Ballot first
190	3.36	3.36	1	3.36	1	Ballot first
191	3.37	3.37	1	3.37	1	Ballot first
192	3.38	3.38	1	4.01	0	Tape 5 38:10 Interface machine
193	3.39	3.39	1	3.39	1	Ballot first
194	3.4	3.4	1	3.4	1	Ballot first
195	3.41	3.41	1	3.41	1	Ballot first
196	3.42	3.42	1	3.42	1	Ballot first
197	3.43	3.43	1	3.43	1	Ballot first
198	3.44	3.44	1	3.44	1	Ballot first
199	3.45	3.45	1	3.45	1	Machine first
200	3.46	3.46	1	3.46	1	Machine first
201	3.47	3.47	1	3.47	1	Machine first
202	3.48	3.48	1	3.48	1	Machine first
203	3.49	3.49	1	3.49	1	Machine first
204	3.5	3.5	1	3.5	1	Machine first
205	3.51	3.51	1	3.51	1	Machine first
206	3.52	3.52	1	3.52	1	Machine first
207	3.53	3.53	1	3.53	1	Machine first
208	3.54	3.54	1	3.54	1	Machine first
209	3.55	3.55	1	3.55	1	Machine first
210	3.56	3.56	1	3.56	1	Machine first
211	4.01	4.01	1	4.01	1	Machine first
212	4.02	4.02	1	4.02	1	Machine first
213	4.03	4.03	1	4.03	1	Machine first
214	4.04	4.04	1	4.04	1	Machine first
215	4.05	4.05	1	4.05	1	Machine first
216	4.06	4.06	1	4.06	1	Machine first
217	4.07	4.07	1	4.07	1	Machine first
218	4.08	4.08	1	4.08	1	Machine first
219	4.09	4.09	1	4.09	1	Machine first
220	4.1	4.1	1	4.1	1	Machine first
221	4.11	4.11	1	4.11	1	Machine first
222	4.12	4.12	1	4.12	1	Machine first
223	4.13	4.13	1	4.13	1	Ballot first
224	4.14	4.14	1	4.14	1	Ballot first

225	4.15	4.15	1	4.15	1		Ballot first
226	4.16	4.16	1	4.16	1		Ballot first
227	4.17	4.17	1	4.17	1		Ballot first
228	4.18	4.18	1	4.18	1		Ballot first
229	4.19	4.19	1	4.19	1		Ballot first
230	4.2	4.2	1	4.2	1		Ballot first
231	4.21	4.21	1	4.21	1		Ballot first
232	4.22	4.22	1	4.22	1		Ballot first
233	4.23	4.23	1	4.23	1		Ballot first
234	4.24	4.24	1	4.24	1		Ballot first
235	4.25	4.25	1	4.25	1		Ballot first
236	4.26	4.26	1	4.26	1		Ballot first
237	4.27	4.27	1	4.27	1		Ballot first
238	4.28	4.28	1	4.28	1		Ballot first
239	4.29	4.29	1	4.29	1		Ballot first
240	4.3	4.3	1	4.3	1		Ballot first
241	5.01	5.01	1	5.01	1		Ballot first
242	5.02	5.02	1	5.02	1		Ballot first
243	5.03	5.03	1	5.03	1		Ballot first
244	5.04	5.04	1	5.04	1		Ballot first
245	5.05	5.05	1	5.05	1		Ballot first
246	5.06	5.06	1	5.06	1		Ballot first
247	5.07	5.07	1	5.07	1		Ballot first
248	5.08	5.08	1	5.08	1		Machine first
249	5.09	5.09	1	5.09	1		Machine first
250	5.1	5.1	1	5.1	1		Machine first
251	5.11	5.12	0	5.12	0	Tape 6 47:55	Research problem
252	5.12	5.12	1	5.12	1		Machine first
253	5.13	5.13	1	5.13	1		Machine first
254	5.14	5.14	1	5.14	1		Machine first
255	5.15	5.15	1	5.15	1		Machine first
256	5.16	5.16	1	5.16	1		Machine first
257	5.17	5.17	1	5.17	1		Machine first
258	5.18	5.18	1	5.18	1		Machine first
259	5.19	5.19	1	5.19	1		Machine first
260	5.2	5.2	1	5.2	1		Machine first
261	5.21	5.21	1	5.21	1		Machine first
262	5.22	5.22	1	5.22	1		Machine first
263	5.23	5.23	1	5.23	1		Machine first
264	5.24	5.24	1	5.24	1		Machine first
265	5.25	5.25	1	5.25	1		Machine first
266	5.26	5.26	1	5.26	1		Machine first
267	5.27	5.27	1	5.24	0	Tape 7 2:45	Interface machine
268	5.28	5.28	1	5.28	1		Machine first
269	6.01	6.01	1	6.01	1		Machine first
270	6.02	6.02	1	6.02	1		Machine first
271	6.03	6.03	1	6.03	1		Machine first
272	6.04	6.04	1	6.04	1		Machine first
273	6.05	6.05	1	6.05	1		Ballot first
274	6.06	6.06	1	6.06	1		Ballot first
275	6.07	6.07	1	6.07	1		Ballot first
276	6.08	6.08	1	6.08	1		Ballot first
277	6.09	6.08	0	9.09	0	Tape 7 13:30	Personal mistake participant
278	6.1	6.1	1	6.1	1		Ballot first
279	6.11	6.11	1	6.11	1		Ballot first
280	6.12	6.12	1	6.12	1		Ballot first
281	6.13	6.13	1	6.13	1		Ballot first
282	6.14	6.14	1	6.14	1		Ballot first
283	6.15	6.15	1	6.15	1		Ballot first
284	6.16	6.16	1	6.16	1		Ballot first
285	6.17	6.17	1	6.17	1		Ballot first
286	6.18	6.18	1	6.18	1	Tape 7: 23:10	Ballot first
287	6.19	6.19	1	6.19	1		Ballot first
288	6.2	6.2	1	6.2	1		Ballot first
289	6.21	6.21	1	6.21	1		Ballot first
290	6.22	6.22	1	6.22	1		Ballot first
291	6.23	6.23	1	6.23	1		Ballot first
292	6.24	6.24	1	6.24	1		Ballot first
293	6.25	6.25	1	6.25	1		Ballot first
294	6.26	6.26	1	6.26	1		Ballot first
295	6.27	6.27	1	6.27	1		Ballot first
296	6.28	6.28	1	6.28	1		Ballot first
297	6.29	6.29	1	6.29	1		Ballot first
298	6.3	6.3	1	6.3	1		Machine first
299	7.01	7.01	1	7.01	1		Machine first

300	7.02	7.02	1	7.02	1		Machine first
301	7.03	7.03	1	7.03	1		Machine first
302	7.04	4.01	0	4.01	0	Tape 7 42:50	Personal mistake participant
303	7.05	7.05	1	7.05	1		Machine first
304	7.06	7.06	1	7.06	1		Machine first
305	7.07	7.07	1	7.07	1		Machine first
306	7.08	7.08	1	7.08	1		Machine first
307	7.09	7.09	1	7.09	1		Machine first
308	7.1	7.1	1	7.1	1		Machine first
309	7.11	7.11	1	7.11	1		Machine first
310	7.12	7.12	1	7.12	1		Machine first
311	7.13	7.13	1	7.13	1		Machine first
312	7.14	7.14	1	7.14	1		Machine first
313	7.15	7.15	1	7.15	1		Machine first
314	7.16	7.16	1	7.16	1		Machine first
315	7.17	7.17	1	7.17	1		Machine first
316	7.18	7.18	1	7.18	1		Machine first
317	7.19	7.19	1	7.19	1		Machine first
318	7.2	7.2	1	7.2	1		Machine first
319	7.21	7.21	1	7.21	1		Machine first
320	7.22	7.22	1	7.22	1		Machine first
321	7.23	7.23	1	7.23	1		Machine first
322	7.24	7.24	1	7.24	1		Ballot first
323	7.25	7.25	1	7.25	1		Ballot first
324	7.26	7.26	1	7.26	1		Ballot first
325	7.27	7.27	1	7.27	1		Ballot first
326	7.28	7.28	1	7.28	1		Ballot first
327	7.29	7.29	1	7.29	1		Ballot first
328	7.3	7.3	1	7.3	1		Ballot first
329	8.01	8.01	1	8.01	1		Ballot first
330	8.02	8.02	1	8.02	1		Ballot first
331	8.03	8.03	1	8.03	1		Ballot first
332	8.04	6.04	0	6.04	0	Tape 8 15:20	Personal mistake participant
333	8.05	8.05	1	8.05	1		Ballot first
334	8.06	8.06	1	8.06	1		Ballot first
335	8.07	8.07	1	8.07	1		Ballot first
336	8.08	8.08	1	8.08	1		Ballot first
337	8.09	8.09	1	8.09	1		Ballot first
338	8.1	8.1	1	8.1	1		Ballot first
339	8.11	8.11	1	8.11	1		Ballot first
340	8.12	8.12	1	8.12	1		Ballot first
341	8.13	8.13	1	8.13	1		Ballot first
342	8.14	8.14	1	8.14	1		Ballot first
343	8.15	8.15	1	8.15	1		Ballot first
344	8.16	8.16	1	8.16	1		Ballot first
345	8.17	8.17	1	8.17	1		Ballot first
346	8.18	8.18	1	8.18	1		Ballot first
347	8.19	8.19	1	8.19	1		Machine first
348	8.2	8.2	1	8.2	1		Machine first
349	8.21	8.21	1	8.21	1		Machine first
350	8.22	8.22	1	8.22	1		Machine first
351	8.23	13.01	0	13.01	0	Tape 8 32:40	Personal mistake participant
352	8.24	8.24	1	8.24	1		Machine first
353	8.25	8.25	1	8.25	1		Machine first
354	8.26	8.26	1	8.26	1		Machine first
355	8.27	8.27	1	8.27	1		Machine first
356	8.28	8.28	1	8.28	1		Machine first
357	8.29	8.29	1	8.29	1		Machine first
358	9.01	9.01	1	9.01	1		Machine first
359	9.02	9.02	1	9.02	1		Machine first
360	9.03	9.03	1	9.03	1		Machine first
361	9.04	9.04	1	9.04	1		Machine first
362	9.05	9.05	1	9.05	1		Machine first
363	9.06	9.06	1	9.06	1		Machine first
364	9.07	9.07	1	9.07	1		Machine first
365	9.08	9.08	1	9.08	1		Machine first
366	9.09	9.09	1	9.09	1		Machine first
367	9.1	9.1	1	9.1	1		Machine first
368	9.11	9.11	1	9.11	1		Machine first
369	9.12	9.12	1	9.12	1		Machine first
370	9.13	9.13	1	9.13	1		Machine first
371	9.14	9.14	1	9.14	1		Machine first
372	9.15	9.15	1	9.15	1		Ballot first
373	9.16	9.16	1	9.16	1		Ballot first
374	9.17	9.17	1	9.17	1		Ballot first

375	9.18	9.18	1	9.18	1		Ballot first
376	9.19	9.19	1	9.19	1		Ballot first
377	9.2	9.2	1	9.2	1		Ballot first
378	9.21	9.21	1	9.21	1		Ballot first
379	9.22	9.22	1	9.22	1		Ballot first
380	9.23	9.23	1	9.23	1		Ballot first
381	9.24	9.24	1	9.24	1		Ballot first
382	9.25	9.25	1	9.25	1		Ballot first
383	9.26	9.26	1	9.26	1		Ballot first
384	9.27	9.27	1	9.27	1		Ballot first
385	9.28	9.28	1	9.28	1		Ballot first
386	9.29	9.29	1	9.29	1		Ballot first
387	9.3	9.3	1	9.3	1		Ballot first
388	10.01	10.01	1	10.01	1		Ballot first
389	10.02	10.02	1	10.02	1		Ballot first
390	10.03	10.03	1	10.03	1		Ballot first
391	10.04	10.04	1	10.04	1		Ballot first
392	10.05	10.05	1	10.05	1		Ballot first
393	10.06	10.06	1	10.06	1		Ballot first
394	10.07	10.07	1	10.07	1		Ballot first
395	10.08	10.08	1	10.09	0	Interface machine	Ballot first
396	10.09	10.09	1	10.09	1		Ballot first
397	10.1	10.1	1	10.1	1		Machine first
398	10.11	10.11	1	10.11	1		Machine first
399	10.12	10.12	1	10.12	1		Machine first
400	11.01	11.01	1	11.01	1		Machine first
401	11.02	11.02	1	11.02	1		Machine first
402	11.03	11.03	1	11.03	1		Machine first
403	11.04	11.04	1	11.04	1		Machine first
404	11.05	11.05	1	11.05	1		Machine first
405	11.06	11.06	1	11.06	1		Machine first
406	11.07	11.07	1	11.07	1		Machine first
407	11.08	11.08	1	11.08	1		Machine first
408	11.09	11.09	1	11.09	1		Machine first
409	11.1	11.1	1	11.1	1		Machine first
410	11.11	11.11	1	11.11	1		Machine first
411	11.12	11.12	1	11.12	1		Machine first
412	11.13	11.13	1	11.13	1		Machine first
413	11.14	11.14	1	11.14	1		Machine first
414	11.15	11.15	1	11.15	1		Machine first
415	11.16	11.04	0	15.04	0	Tape 9 50:20 Personal mistake participant	Machine first
416	11.17	11.17	1	11.17	1		Machine first
417	11.18	11.18	1	11.18	1		Machine first
418	11.19	11.19	1	11.19	1		Machine first
419	11.2	11.2	1	11.2	1		Machine first
420	11.21	11.21	1	11.21	1		Machine first
421	11.22	11.22	1	11.22	1		Ballot first
422	11.23	11.23	1	11.23	1		Ballot first
423	11.24	11.24	1	11.24	1		Ballot first
424	11.25	11.25	1	11.25	1		Ballot first
425	11.26	11.26	1	11.26	1	Tape 10 7:00	Ballot first
426	11.27	11.27	1	11.27	1		Ballot first
427	11.28	niets	0	7.06	0	Tape 9 9:00 Personal mistake participant	Ballot first
428	11.29	11.29	1	11.29	1		Ballot first
429	12.01	12.01	1	12.01	1		Ballot first
430	12.02	12.02	1	12.02	1		Ballot first
431	12.03	12.03	1	12.03	1		Ballot first
432	12.04	12.04	1	12.04	1		Ballot first
433	12.05	12.05	1	12.05	1		Ballot first
434	12.06	12.06	1	12.06	1		Ballot first
435	12.07	12.07	1	12.07	1		Ballot first
436	12.08	12.08	1	12.08	1		Ballot first
437	12.09	12.09	1	12.09	1		Ballot first
438	12.1	12.1	1	12.1	1		Ballot first
439	12.11	12.11	1	12.11	1		Ballot first
440	12.12	12.12	1	12.12	1		Ballot first
441	12.13	12.13	1	12.13	1		Ballot first
442	12.14	12.14	1	12.14	1		Ballot first
443	12.15	12.15	1	12.15	1		Ballot first
444	12.16	12.16	1	12.16	1		Ballot first
445	12.17	12.17	1	12.17	1		Ballot first
446	12.18	12.18	1	12.18	1		Machine first
447	12.19	12.19	1	12.19	1		Machine first
448	12.2	12.2	1	12.2	1		Machine first
449	12.21	12.21	1	12.21	1		Machine first

450	12.22	12.22	1	12.22	1	Machine first
451	12.23	12.23	1	12.23	1	Machine first
452	12.24	12.24	1	12.24	1	Machine first
453	12.25	12.25	1	12.25	1	Machine first
454	12.26	12.26	1	12.26	1	Machine first
455	12.27	12.27	1	12.27	1	Machine first
456	12.28	12.28	1	12.28	1	Machine first
457	12.29	12.29	1	12.29	1	Machine first
458	12.3	12.3	1	12.3	1	Machine first
459	13.01	13.01	1	13.01	1	Machine first
460	13.02	13.02	1	13.02	1	Machine first
461	13.03	13.03	1	13.03	1	Machine first
462	13.04	13.04	1	13.04	1	Machine first
463	13.05	13.05	1	13.05	1	Machine first
464	13.06	13.06	1	13.06	1	Machine first
465	13.07	13.07	1	13.07	1	Machine first
466	13.08	13.08	1	13.08	1	Machine first
467	13.09	13.09	1	13.09	1	Machine first
468	13.1	13.1	1	13.1	1	Machine first
469	13.11	13.11	1	13.11	1	Machine first
470	13.12	13.12	1	13.12	1	Machine first
471	13.13	13.13	1	13.13	1	Ballot first
472	13.14	13.14	1	13.14	1	Ballot first
473	13.15	13.15	1	13.15	1	Ballot first
474	13.16	13.16	1	13.16	1	Ballot first
475	13.17	13.17	1	13.17	1	Ballot first
476	13.18	13.18	1	13.18	1	Ballot first
477	13.19	13.19	1	13.19	1	Ballot first
478	13.2	13.2	1	13.2	1	Ballot first
479	14.01	14.01	1	14.01	1	Ballot first
480	14.02	14.02	1	14.02	1	Ballot first
481	14.03	14.03	1	14.03	1	Ballot first
482	14.04	14.04	1	14.04	1	Ballot first
483	14.05	14.05	1	14.05	1	Ballot first
484	14.06	14.06	1	14.06	1	Ballot first
485	14.07	14.07	1	14.07	1	Ballot first
486	14.08	14.08	1	14.08	1	Ballot first
487	14.09	14.09	1	14.09	1	Ballot first
488	14.1	14.1	1	14.1	1	Ballot first
489	14.11	14.13	0	14.11	1	Interface ballot
490	14.12	14.12	1	14.12	1	Ballot first
491	14.13	14.13	1	14.13	1	Ballot first
492	14.14	14.14	1	14.14	1	Ballot first
493	14.15	14.15	1	14.15	1	Ballot first
494	14.16	14.16	1	14.16	1	Ballot first
495	14.17	14.17	1	14.17	1	Ballot first
496	14.18	14.18	1	14.18	1	Machine first
497	14.19	14.19	1	14.19	1	Machine first
498	14.2	14.2	1	14.2	1	Machine first
499	14.21	14.21	1	14.21	1	Machine first
500	14.22	14.22	1	14.22	1	Machine first
501	14.23	14.23	1	14.23	1	Machine first
502	14.24	14.24	1	14.24	1	Machine first
503	14.25	14.25	1	14.25	1	Machine first
504	15.01	15.01	1	15.01	1	Machine first
505	15.02	15.02	1	15.02	1	Machine first
506	15.03	15.03	1	15.03	1	Machine first
507	15.04	15.04	1	15.04	1	Machine first
508	15.05	15.05	1	15.05	1	Tape 11 20:00 Machine first
509	15.06	15.06	1	15.06	1	Machine first
510	16.01	16.01	1	16.01	1	Machine first
511	16.02	16.02	1	16.01	0	Tape 11: 23:40 Interface machine
512	16.03	16.03	1	16.03	1	Machine first
513	16.04	16.04	1	16.04	1	Machine first
514	16.05	16.05	1	16.05	1	Machine first
515	16.06	16.06	1	16.06	1	Machine first
516	16.07	16.07	1	16.07	1	Machine first
517	16.08	16.08	1	16.08	1	Machine first
518	16.09	16.09	1	16.09	1	Machine first
519	16.1	16.1	1	16.1	1	Machine first
520	16.11	16.11	1	16.11	1	Ballot first
521	16.12	16.12	1	16.12	1	Ballot first
522	16.13	16.13	1	16.13	1	Ballot first
523	16.14	16.14	1	16.14	1	Ballot first
524	17.01	17.01	1	17.01	1	Ballot first

525	17.02	17.02	1	17.02	1	Ballot first
526	17.03	17.03	1	17.03	1	Ballot first
527	17.04	17.04	1	17.04	1	Ballot first
528	17.05	17.05	1	17.05	1	Ballot first
529	17.06	17.06	1	17.06	1	Ballot first
530	17.07	17.07	1	17.07	1	Ballot first
531	17.08	17.08	1	17.08	1	Ballot first
532	17.09	17.09	1	17.09	1	Ballot first
533	17.1	17.1	1	17.1	1	Ballot first
534	17.11	17.11	1	17.11	1	Ballot first
535	17.12	17.12	1	17.12	1	Ballot first
536	17.13	17.13	1	17.13	1	Ballot first
537	17.14	17.14	1	17.14	1	Ballot first
538	17.15	17.15	1	17.15	1	Ballot first
539	17.16	17.16	1	17.16	1	Ballot first
540	17.17	17.17	1	17.17	1	Ballot first
541	17.18	17.17	0	17.18	1	Ballot first
542	17.19	17.19	1	17.19	1	Ballot first
543	17.2	17.2	1	17.2	1	Ballot first
544	17.21	17.21	1	17.21	1	Ballot first
545	17.22	17.22	1	17.22	1	Machine first
546	17.23	17.23	1	17.23	1	Machine first
547	17.24	17.24	1	17.24	1	Machine first
548	17.25	17.25	1	17.25	1	Machine first
549	17.26	17.26	1	17.26	1	Machine first
550	17.27	17.27	1	17.27	1	Machine first
551	18.01	18.01	1	18.01	1	Machine first
552	18.02	18.02	1	18.02	1	Machine first
553	18.03	18.03	1	18.03	1	Machine first
554	18.04	18.04	1	18.04	1	Machine first
555	18.05	18.05	1	18.05	1	Machine first
556	18.06	18.06	1	18.06	1	Machine first
557	18.07	18.07	1	18.07	1	Machine first
558	18.08	18.08	1	18.08	1	Machine first
559	18.09	18.09	1	18.09	1	Machine first
560	18.1	18.1	1	18.1	1	Machine first
561	19.01	19.01	1	19.01	1	Machine first
562	19.02	19.02	1	19.02	1	Machine first
563	19.03	19.03	1	19.03	1	Machine first
564	19.04	19.04	1	19.04	1	Machine first
565	19.05	19.05	1	19.05	1	Machine first
566	19.06	19.06	1	19.06	1	Machine first

