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Bosnia and Herzegovina

Information Technology Mission

May - September 1996

James Miller

Todd Penland

Sylvia Sanchez

Roger Plath

Scott Lansell



International Foundation for Election Systems
1101 15th Street, N.W., Third Floor
Washington, D.C. 20005
phone: (202) 828-8507 fax: (202) 452-0804

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I. IFES IN BOSNIA AND HERZEGOVINA

Beginning in October 1995, at the request of the U.S. Department of State, IFES offered legal assistance to the drafters of the Dayton Accords during a series of meetings in Washington, D.C. prior to the actual discussions in Dayton, Ohio. Immediately following this assistance, an IFES Executive Vice President Jeff Fischer participated as a member of two ODIHR-led (Office of Democratic Institutions and Human Rights) Election Assessment Missions in December 1995 and January 1996. In February 1996, again at the request of the Department of State, IFES deployed a two-person team to Sarajevo for one month to provide technical assistance to the newly instituted Provisional Election Commission (PEC).

Beginning in February 1996, IFES formally launched three USAID-funded on-site projects which assisted with preparations for the September 14 National Elections. In support of the OSCE, an IFES Technical Assistance Advisory team, which included election specialists with various technical skills ranging from election administration to election commodity procurement, arrived in Sarajevo in June 1996. Beginning in July 1996, an IFES Voter Education Office was opened in Zenica to implement an interactive voter education and outreach project utilizing a series of workshops and training exercises throughout the region. This presence has continued in preparation for the September 13/14 Municipal Elections in 1997.

This report discusses in detail the USAID-funded project which was the most technologically complex of the IFES projects - an Information Technology Mission whose work began in May 1996 as the OSCE began to realize the importance and necessity of an Information Technology capability within the Sarajevo headquarters.

II. INFORMATION TECHNOLOGY SUPPORT TO THE OSCE

By April of 1996, IFES consultants and staff who had worked in the OSCE-Sarajevo Mission had convinced USAID of the pressing need for a complete Information Technology (IT) Department which would directly support the OSCE-Sarajevo Mission's IT operations. The existing staff was quite capable but could not provide installation and support services, install software upgrades, serve as a 24-hour network administrator, database administrator, equipment and software trainer, and "Help Desk" monitor. In order to support the IT department in Sarajevo, the IFES "IT Team" arrived in May 1996 and included the following staff personnel:

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- James Miller as Project Manager to oversee the full implementation of the IT Team's efforts in Sarajevo and reported to the Director General for Elections at OSCE-Sarajevo;
- Roger Plath as "Help Desk" Coordinator to serve as the IT Team's principle liaison at the "Help Desk" for election staff and local election officials using the networks charged with covering daily Q&As.
- Sylvia Sanchez as a Systems Administrator responsible for design and installation of data networks and the coordination of local support staff tasked with the IT program; and
- Todd Penland to serve as Senior Database Developer charged with the design and construction of IT applications.

III. INTRODUCTION TO THE INFORMATION TECHNOLOGY MISSION

IFES' involvement in the OSCE IT Office was initially designed as relatively minor assistance to provide specific technical services that were identified during an initial IT Assessment by IFES in April 1996. The Assessment (Attachment A) was conducted by Michael Yard who is the IFES IT Technical Manager for an on-going long-term voter registration and identification project in Ghana. This comprehensive assessment, which resulted in numerous recommendations, was only partially implemented, at least initially, due to limited funding and limited support from OSCE.

An initial USAID-funded IFES Status Report (Attachment B), which followed the Assessment, consisted of a one-person team of James Miller who had been sent to provide senior database expertise as the 1991 Census data was developed into a workable voter list. At the same time, two additional specialists arrived under an ODIHR-funded project to develop the Official OSCE Elections WWW Site (Attachment C). Roger H. Plath, an IFES Information Specialist, and Adele Valentino were sent to assist in the development of the WWW site and lay the groundwork to update and maintain the site from the United States¹. The timing of the Web Team's arrival later became a significant advantage as Mr. Plath's scope of work expanded upon the completion of the first mission. He then moved to the USAID-funded IT Project.

When IFES arrived in May 1996, the situation was already desperate. The entire OSCE IT infrastructure consisted of a small network for the administrative side of the OSCE (not for the elections component), poorly functioning desktop and laptop computers, one freshly-arrived IT staffer, and one outstanding, but overburdened local staff person who had been assigned the task

¹With funding from the Office of Democratic Institutions and Human Rights (ODIHR), IFES developed the OSCE' official World Wide Web Site.

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of trying to maintain and support the entire Mission.

It quickly became evident that from simple "Help Desk" support, to the overall IT infrastructure, the Mission was seriously lacking in both IT staff and equipment. Both Jim Miller and Roger Plath were frequently distracted from their assigned tasks by requests for support from Mission staff which diverted their attention from developing the Mission's infrastructure. Although both trips were initially short-term, it became clear that they had become essential to the overall success of the IT Division and its functioning. Due to this, Jim Miller was asked to take the role of IT Director whereby IFES (with USAID approval) extended his contract through September 1996. Roger Plath was asked to stay through September as the IT Division's Technical Support Manager. IFES also identified and delivered two additional database developers - Sylvia Sanchez and Todd Penland.

The following accomplishments could be directly attributed to the IT Department (each usually in four languages²):

- Production of a Provisional and Final Voters list of 3.5 million people
- Processing more than 500,000 Forms 1, 2 and 3 (Attachment D)
- Creation of a Political Party system with 28,000 candidates
- Creation of a Polling Station database of 4300 sites
- Creation of an Election Monitors Database for approximately 1000 people
- Creation of a system to assist refugee voter registration
- Production of polished automated election results in Power Point for the Media Center
- Publishing up-to-the-hour election results on the World Wide Web (WWW)
- Support of over 300 personal computer systems for the OSCE
- Creation of a computer and networking infrastructure for the HQ Building, Bank Building, Statistical Institute, and the Media Center
- Providing full Internet and e-Mail access for hundreds of OSCE Mission members
- Creation of Candidate and Polling Station Posters
- Creation of an Election Appeals Database

² In Bosnia and Herzegovina, which was comprised of Bosnian Muslims, Bosnian Serbs, and Bosnian Croats of Bosnian decent, there was a need to have the capacity to prepare and produce materials (hard copy and electronic) in Serbian, Croatian, and Bosnian. Prior to the war the language had been recognized as Serbo-Croatian, however since the upheaval there was a political movement afoot to distinguish between each ethnic version of the language which in many cases only involved select words but required the OSCE and IFES to carefully respect ongoing "linguistic transformations."

- Creation of a Vote Tabulation and Seat Allocation system

This final report will detail the capabilities and functions of the primary tasks taken from the list above. It will also present lessons learned throughout the mission and make global recommendations.

IV. 1991 CENSUS AND VOTERS LIST

IT Department Director Jim Miller's first task was to develop a Provisional Voters List (PVL) for the September 1996 National elections. An earlier version had been printed, but was unintuitively organized by census tract and was too cumbersome to be useful. As Miller began to investigate what needed to be done with the 1991 Census, which was the Dayton-mandated basis for the voters list, he discovered that all that was available was a 3.5 million-row *ASCII* text file. Upon further investigation, he discovered that since *ASCII* does not support the letters in the Serbo-Croatian language that differ from English, the file was full of odd diacritical marks in the place of those letters. Miller was able to import the file into a *MS Access* database and write a routine to translate the diacritical marks into the corresponding Serbo-Croatian letters for display and printing (although the database still actually contained the diacritical marks which created problems for sorting and querying the records in the database). The 1991 Census was further flawed by the fact that it was missing almost 33% of the citizen ID-numbers and contained other significant omissions and misspellings.

Because Voter Registration for the 1996 National Elections was scheduled to begin only weeks after Mr. Miller's arrival, and because the voters list still had to be printed in Italy, this result was the best that could be achieved. *MS Access*, which was designed to work optimally with databases 1/100th the size of the 1991 Census, and low-end hardware, were also an impediment to progress, but no other database applications or hardware were available at the time. These problems, lack of time and improper tools, would continue to impede the IT Department through the elections.

A PVL2 was printed, sorted by ID number, and successfully used during the voter registration which occurred before the September 14 elections. There were, however, numerous complaints about names not being found on the PVL2. These complaints were valid, but resulted from the overall poor quality of the original data, as received from the Statistical Institute, rather than any IT-specific problem. Despite the problems encountered, over 500,000 of the Forms 1, 2, and 3 were processed by IT. The following is an excerpt from Mr. Miller's report on the forms processed and the PVL2 update:

Updating of the Voters List

Due to the problems already mentioned with the 1991 census, any attempt to update it became problematic. Completed voter registration Forms "1" and "2", which were our source documents for an update, had very similar data integrity problems. Only about 70% of the registration forms received contained valid ID numbers, and many forms we received were unreadable, or had obviously flawed information. All attempts to update the Voters List using these forms were unsuccessful due to the uncertainty of having a correct match. The best we could do was a 50% update which proved to be more hazardous than not updating at all.

Voter Registration Form 1

This form was used primarily to determine absentee ballot requirements. Out of 265,610 Form 1's that were entered, 154,866 were requests for absentee ballots. This information was used to first determine total absentee ballot production based upon the 1991 municipality. A summary report was produced that was used by our printer in Vienna. The Form 1 data was then sorted by current municipality to determine which absentee polling locations needed to receive which ballots (there was only one absentee polling station per municipality). This 170+ page report "In-country Absentee Voters" was a critical component to providing the information needed to run these elections.

Voter Registration Form 2

This form was used primarily to determine the number, and current location of displaced people. Unfortunately, this information could not be used to update the voters list for the reasons already mentioned. Still, a total of 262,275 Form 2's were keyed into the system which allowed for reports to be generated that aided in determining the movement of population since 1991. This allowed for more accurate estimations in deciding on in-country ballot production. Primary Reports that can be generated from Form 2 data are:

- 'Displaced People Who Want To Vote In Current Municipality', broken down by 1991 municipality.
- 'Displaced People Who Want To Vote In Future Municipality', broken down by *current* municipality (this indicates potential movement of people, in-country, on election day).

Although the voter verification (registration) activity provided some useful information, it served equally to highlight the poor quality of the 1991 Census Data. The verification exercise made clear the impossibility of updating the 1991 Census Data, and the necessity to conduct a full and complete Voter Registration, both in-country and for refugees Out-of-Country (Attachment E). A complete Registration will allow voters to be assigned to specific polling places which will decrease the chances of multiple voting and allow election supplies and ballots to be more accurately produced and distributed to reduce excesses and therefore cost. The conduct of a complete Voter Registration, and the assignment of voters to specific polling places is perhaps the strongest recommendation that this report can make³.

V. POLITICAL PARTY DATABASE

A database system was designed to register political parties, coalitions and independent candidates. The database served to collect the data to allow the ballots to be printed correctly and also allowed the OSCE to verify each candidate's eligibility to actually run in the elections. A candidate had to meet the following eligibility requirements: be on the voters list, not run for more than one office not be a war criminal. As stated in Jim Miller's trip report, the database had the following capabilities:

- Data entry for political parties and candidates on the basis of parties' application for a certain electoral race.
- Updating and printing political parties, coalitions and independent candidates basic data

³To assist in determining voter eligibility for this task, Mr. Fitzgerald Jean successfully redesigned the 1991 Census database. This redesign, made in the months immediately following the 1996 elections, now allows for more complex and useful searches for voters on the list, providing voters with the maximum opportunity to find their names at a much higher speed than previously possible. This follow-on mission was funded by USAID under a separate project.

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- (names, alphabet indication, entity, data about president and principal office)
- Updating and printing data about party officers (title, name, address, phone)
- Updating data about intentions of political parties for elections (electoral race selection, name on ballots indication)
- Updating data about war criminals indicated by Hague Tribunal
- Printing reports for ballots in A4 format as preparation for final ballots printing
- Finding candidates by name and identity number
- Updating and printing data about electoral units (municipalities, cantons and institutional seats)
- Print posters for each electoral race with lists of political parties or coalitions and their candidates and independent candidates
- Print all parties/coalitions (ordered by position on ballot) and their candidate names (ordered by their ordinal numbers) for every electoral race in A3 format. Reports include headers and disclaimers, necessary translations and alphabets.
- Summary report with party names and their total number of candidates for every singular seat
- Summary report with party names and their total number of candidates for every singular canton
- Candidate names for parties for every singular seat
- Candidate names for parties for every singular canton
- List of all parties names in English
- List of all party names as they were registered
- List of party names from the Federation of Bosnia and Herzegovina as they were registered
- List of party names from the Republika Srpska (RS) as they were registered

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- List of Canton names with number of seats
- List of municipality names with number of polling stations, populations and how they pertained to the Cantons

Though this database system was relatively easy to develop, significant problems arose due to the way that data was presented to IT for inclusion in the database. Quoting from Todd Penland's trip report:

The likelihood that a database application will be developed in a reasonable amount of time and with reasonable assurance that the data will be useful depends heavily on the consistency in the way the source data is presented. In this case there was no such consistency. Parties were permitted to register separately, as members of coalitions, and/or separately but as members of unnamed coalitions. Parties were permitted to present lists of candidates which were empty, did not contain sufficient data to positively identify candidates during the verification process, and/or with both Latin and Cyrillic characters in candidate names - a situation which cannot exist in an *MS Access* record due to the formatting restrictions built into *MS Access* itself. Parties were permitted to amend their lists of candidates even after the cutoff dates for such critical reports as candidate verification and poster proofs had passed.

In addition to this, the forms that were designed for the parties to use to register were designed with no input from IT. A properly designed form can significantly reduce data-entry errors by "forcing" data to be presented clearly and correctly. Since IT was not included in the design of the form, it was designed without any attention given to those who would have to enter and use the data later. Lack of communication, or at least effective communication, was often a problem between IT and the other departments who requested IT services. In the future, any project which involves IT services should be worked on with IT from concept to completion.

Finally, perhaps the biggest problem encountered, with this particular database system as well as most others, was the fact that

the ground rules and procedures were constantly shifting. A database application could be developed based upon one set of criteria that would then be modified a short time later. This creates a situation where the database must be constantly redesigned (very time consuming), or simply not meet all the expectations that end-users have. In the future, databases, and even forms, development should not begin until there are reasonable expectations that the requirements are stated, understood, and stable.

VI. POLLING STATION DATABASE

The Polling Station Database was designed to assist with the location of polling places and to increase logistical efficiency. Again quoting from Mr. Miller's trip report, the database had the following capabilities:

- Data entry and update forms for polling station data
- Polling Stations Report
- Reports on Polling Stations Posters
- Absentee Polling Stations in 3 languages
- Full and Quarter Page Municipality Posters
- Full and Quarter Page Absentee Labels

The initial intention had been that the Local Election Commissions and OSCE Field Offices would identify the polling place locations. This did not happen as planned, and IFOR (Implementation Force) was asked to use its country-wide presence to assist in this task. Unfortunately, forms were once again designed without IT input. Todd Penland went on to report:

"...we were provided with source documents which had no logical structure and were primarily written (often handwritten) in English. This set up a situation which made it impossible to produce a usable database without extensive data entry supervision (most data entry operators did not read or speak English)...This was beyond the

capability of the data entry group who had only five supervisors covering more than one hundred data entry operators.”

Due to a lack of coordination, the exact location identification system consisting of map coordinates was inconsistently applied and more than one type of mapping coordinates was used. This lack of consistency rendered the map coordinates essentially useless as one could never be sure which coordinate system had been applied to which polling station.

A database of polling stations was also needed to produce posters to inform the voters where the polling places were located. This required that the database contain English, Serbian, Bosnian, and Croatian. Because this requirement was not clearly stated in the beginning, problems later arose with the database design. IFES' Sylvia Sanchez made this technical recommendation:

When an application requires data to be displayed in multiple languages, database tables should be designed to contain a separate field (within the same table) for each required language. The polling stations database table which contains the station address, for instance, should contain a field for the address in English and a second field for the address in Bosnian. The creation of multiple databases or multiple tables within an database should be avoided. Multiple databases introduces unnecessary maintenance overhead since all modifications must be implemented in more than one database. The use of multiple tables in a database requires fields in a table not affected by language translation (e.g., numeric or Boolean fields) to be entered multiple times when one entry would suffice. Also, problems arise in linking tables for different languages if key field(s) were incorrectly entered.

Data entry for applications which incorporate multiple languages may follow a couple of options:

- All table fields for a record can be entered at one time.
- All fields which do not require translation can be entered in the first round of data entry. Any fields requiring translation can be entered in one of the languages to be applied. The following round(s) would allow for the entry of fields which require translation.

On the September 14 election day, Election Supervisors completed forms noting conditions found at the polling stations that they visited. These forms provided useful data to update the Polling Station database in preparation for Municipal Elections initially rescheduled for November 1996, the rescheduled for September 1997.

VII. INTERNATIONAL OBSERVERS DATABASE

A database system was requested to register and deploy the International Observers invited by the OSCE or affiliated organizations. From Jim Miller's trip report, system capabilities included:

- Updating and printing basic information about international observers (name, country, organization, languages, experience/speciality, participation in counting process)
- International observers deployment by LTO, regional center, field office, municipality and airport
- Searching and displaying data by all possible criteria
- Reports Included
 - International observers names in alphabetical order
 - Observers deployed by LTO
 - Observers deployed by regional center
 - Observers deployed by field office
 - Observers deployed by municipality
 - Observers deployed by airport
 - Observers participating in counting process
 - Observers deployed by airport

- Total for observers including totals by country, experience, language, and organization

VIII. VOTE TABULATION / SEAT ALLOCATION / MEDIA PRESENTATION

Three systems were developed by IT for election day and the days that followed until results were final. Due to the sensitive and complex nature of these systems, a large amount of time was dedicated to them during August and September. From Jim Miller's trip report, system capabilities included:

- Double entry of counting sheet summaries for data verification
- Results for each electoral race with number of votes, percentages and list of municipal counting centers which have reported
- Results for each electoral race with number of votes, percentages and number of allocated seats
- Results for each electoral race broken down by municipal counting centers
- Valid, invalid and total votes, totals and percentages for each electoral race and each municipal counting center and also grand total about votes per municipal counting centers consisting all electoral races
- List of municipal counting centers which have not reported results
- Separate list of municipal counting centers which have reported results by electoral race
- Results reported from the warehouse
- Report of Party Name, Cross Reference for reports

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- Report on Party information including President's Name, Phone, Fax
- *Power Point* Slide generation (Charts, Graphs)
- World Wide Web election results presentation

There were a few difficulties encountered in the tabulation, allocation, and presentation process. The following excerpt from Mr. Miller's trip report provides a background on the systems as well as discusses some difficulties encountered.

- A system was developed to enter election results by municipality, calculate results, and allocate seats. Election results were then displayed on:
 - Large screen monitors in the Media Center⁴
 - Live video feed to the European Broadcast Union
 - Hard copy reports

In addition, the IT Division provided an ad hoc query station for customized reports used very frequently by journalists. Finally, World Wide Web updates were regularly updated and posted on the WWW (Attachment F).

The system utilized *MS Access* as a database engine for tabulating counting sheets. Excel was used to produce charts and graphs, and finally results were published on very high quality *Power Point* slides and were broadcast worldwide.

IT did encounter one major problem. This was the receiving the actual summary sheets from each of the 147 counting centers. These summaries were supposed to be brought directly to us for

⁴The IT Team, specifically Todd Penland, closely coordinated with other IFES consultants in developing the Media Center to accommodate several hundred international and local journalists, their crews, and required hookups. Post-election reports noted the level of sophistication of the Media Center and the capacity it had in delivering detailed election results on the numerous races.

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data entry from the Joint Elections Operation Center (JEOC), and the agreement was that no tally was to be performed before we received them. As it turns out, we were at least 4 to 6 hours behind the actual receipt of counting summaries, and in some cases over 2 days behind. The problem was that the High Representative's office, and the Ambassador's [Frowick] office were getting the Counting Center summaries directly from the fax machines in the Joint Elections Operation Center (JEOC). They then ran their own totals, and the results quickly leaked to the press. The *Washington Post* actually printed results before the 'official' tabulation group, which was IT, even had them.

By the time the counting summaries got to the Media Center, and we actually published results, it was old news. In fact, while we were about half way through our tabulation, Ambassador Frowick read the presidential final preliminary results audibly, from our location at the media center, even while all our big screen monitors were displaying numbers that were hopelessly behind.

Todd Penland, who was managing this operation, also provided useful information in his preliminary trip report as quoted below:

Due to the extremely sensitive nature of an application of this type, we worked from beginning to end to ensure that no mistakes could be made in data entry which were not immediately brought to the attention of data entry operators and supervisors. Following the guidelines submitted to us by the Director and senior staff of the Joint Elections Operations Center (JEOC), Sergej Mehmedovic (a local hire developer), developed a program that allowed the entry of one and only one result per contest, per municipal counting center. The system was completed well in advance of election day and was extensively tested and re-tested to ensure that it operated perfectly. Data entry staff members were trained for three days prior to the election and were well-prepared once results began to come in from JEOC.

After we were first approached by the Director General for Elections (DG-E) Jeff Fisher concerning the establishment of the



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JEOC, Jim Miller and I met with Frederick "Bud" Slattery, Director of the JEOC, and Lt. Col. Charlie Jay. I expressed my concern about the number of hands vote summary reports would pass through before being delivered to the tabulation center. It was my opinion, which Jim [Miller] shared, that the reports should come directly to the tabulation center for input. Col. Jay made a strong argument that the JEOC, which would have secure and reliable telephone contact the Regional Centers should receive the reports first and handle any problems which were apparent upon receipt before forwarding the results to the tabulation center. Somebody in the meeting mentioned the possibility of the JEOC maintaining a separate accounting of the votes - which Jim and I flatly rejected as inappropriate and an unnecessary duplication of efforts which would only delay the reporting of results to the media and to the public. Bud Slattery agreed and assured us that the JEOC role in the tabulation process would be to act as our communications link to the Regional Centers as errors were discovered on the incoming reports. The JEOC was, under no circumstances, to engage in tabulation activity of any kind.

On September 16, 1996, the first results were delivered to the tabulation center by JEOC courier. Approximately 100 forms were delivered, more than half of which had to be returned to the JEOC because they were not filled out correctly, were not summed correctly, were missing the race for which the votes were being cast, were missing the municipality in which the votes were cast or were duplicates of forms which had already been entered. This ratio of forms which could not be entered to total forms received would remain virtually unchanged through the remainder of the vote tabulation process. It seemed from the beginning - a suspicion which would later be proved true - that no verification effort was being made at the JEOC at all. The most troubling occurrence was not the failure of the JEOC to perform its function as "proofreader" and communications link, but the appearance of duplicate forms in the packets delivered to us from the JEOC. Why, we asked, were copies being made of the forms - and more importantly - how were these copies making their way into our packets? Furthermore, a

new wrinkle had appeared in the form of "updates" to previously reported preliminary results.

As mentioned earlier, the tabulation program was designed specifically to allow one form to be entered per race, per municipal counting center. The appearance of updates to previously entered data - something that had never been discussed in any of the meetings held with, or written materials received from the JEOC required that we change the design of the program by disabling the procedure which prevented the entry of more than one form per race, per counting center. This was one of the most important safeguards built into our system and unfortunately the removal of this safeguard led to errors in the count which should not have occurred, and would not have occurred but for the convergence of a number of factors growing out of tabulation activities outside of the procedures which had been agreed upon in the meeting between Bud Slattery, Charlie Jay, Jim Miller, and myself.

In addition to a 48-hour delay between receipt of forms at the JEOC and the delivery of the forms to the tabulation center, what resulted from the summary reports passing through all these extra hands was that duplicate reports began to appear again among the forms which were delivered to the tabulation center. Apparently, someone was making copies of the forms for their own use but failed to insure that these copies didn't end up at the tabulation center when they were finished with them.

Fortunately, the data entry supervisors at the tabulation center were aware of the duplicates and continued to return them to the JEOC as they were discovered. Unfortunately not all of them were discovered. About 10-15 forms made it past the supervisors and were entered into the tabulation system in error.

A few days into the counting process, a watch-dog group [*The International Crisis Group* or ICG] notified the international media that they were filing a complaint that the number of ballots cast in certain races exceeded the total number of registered voters in the country. As soon as we became aware of this report, we

immediately began an internal audit of all forms which had been entered into the tabulation system. We mistakenly thought that the complaint was due to errors which might have been caused by the entry of duplicate forms into our system. As it turned out, the complaint was due to irregularities that had been reported at polling stations where allegations of ballot box stuffing had been made. Nevertheless, we discovered the existence of the previously mentioned duplicates and immediately removed the duplicates from the system. From that time forward, we regularly checked for duplicate entries and no additional duplicates found their way into reports which were available to the media.

Seat Allocation Program

This program, also developed by Sergej Mehmedovic, applied a seat allocation formula developed by John Reid [an OSCE Mission member supplied by *Elections Canada*], to the final results we reported in House and Assembly-level races. This program performed perfectly and although some questions were raised by parties who lost seats between the report of preliminary results and the report of final results, everyone who reviewed the procedure agreed that it worked correctly.

This application used *Microsoft Access*, *Microsoft Excel*, and *Microsoft PowerPoint* to display election results on twelve video displays in the Media Center. Data which had been entered into the *Access*-based vote tabulation system was summarized and charted in *Excel* using two *Visual Basic* procedures. Tables and charts were then linked to slides in *PowerPoint* which were subsequently converted from VGA (computer graphics) to PAL (video graphics) format and displayed on the video monitors located throughout the media center.

Development of this application took two months and involved all members of the Systems Development Group. MSgt. Mark Branham supervised the majority of this work. This was our most visible project and generated a great deal of praise from the media. Bosnian television used our presentations to report results to the

public. Reports also appeared on *CNN International* and numerous European news outlets concerning the Systems Development Group and the methods employed to report election results.

IX. INTERNET

The IFES team also made a significant contribution to the OSCE by bringing Internet access to the Mission. After months of struggling to find a solution to Bosnia's antiquated and war-damaged communications infrastructure and investigating numerous possibilities, we were finally able to make an agreement, and a connection, with the University of Sarajevo Internet Center. This connection is dedicated and operates 24 hours a day (power, weather, and luck permitting) to provide a unique e-Mail address for each Mission member and allowing for e-Mail communications worldwide. The connection also provides full Internet access such as WWW and FTP (File Transfer Protocol) to authorized staff.

Internet access and e-Mail, for those who took advantage of it, significantly reduced phone traffic and associated costs, and provided a new and reliable form of communication between the Mission and the rest of the world, including sponsoring governments and agencies as well as to the OSCE Secretariat in Vienna. The cost and frustration of faxing was also reduced as any computer-generated document could now be attached to an e-Mail and sent electronically.

X. GLOBAL RECOMMENDATIONS / LESSONS LEARNED

This report has attempted to discuss the most significant of the IT Division and its numerous tasks, and has noted problems and successes with each. Although there were specific problems in each major area, there were also common problems and issues. These commonalities constitute the lessons learned in the first six months of the IFES IT Mission under USAID funding.

1. A complete Voter Registration can allow voters to be assigned to specific polling places which will decrease the chances of multiple voting and allow election supplies and ballots to be more accurately produced and distributed to reduce excesses and therefore cost. The conduct of a complete Voter Registration, and the assignment of voters to specific polling places, is perhaps the strongest recommendation that this report can make.
2. Despite the fact that nearly all departments, including Elections, within the OSCE continue

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to rely heavily on the IT Department for critical support of their activities, IT seemed to only come together as an afterthought once IFES arrived and articulated the need. The IT Department should have been fully staffed and operational at the same time as all other Departments. This was a mistake that left IT constantly trying to play catch-up, rather than proactively providing services for the Mission.

3. Requests for IT's services were most often relayed at the last minute, and with little thought having gone into their formation. This left IT without sufficient time to properly develop the application. To compound the problem, requests were often made verbally which left significant room for misinterpretation, and frequently, although the requested application had been developed, complaints were made that the application did not do all that the end user wanted primarily because the end user never carefully considered what he/she would eventually need. Because IT had no written request for the application, it was often assumed that the error was made by IT, when in fact IT most often delivered exactly what was requested. In the future, all IT service requests should be made in writing and there should be frequent meetings between the developer and the end user to ensure the final product accurately meets the needs of the end user and that the developer doesn't have to spend inordinate amounts of time fixing problems that resulted from lack of clear communication or later having to add functionality that should have been requested at the beginning.

4. The IT Department, including all of its database developers, should be located in the same building as the Elections Unit to facilitate efficient communication during application development and later for support. Because the development team was located in the OSCE's Statistical Institute, the developers were so completely "out of the loop" that they could not anticipate needs and weren't always even aware of significant dates in the timeline which needed to be complied to. It also made development more time consuming by often forcing the developers to walk over to the HQ to find someone in order to ask a simple question.

5. When a database application is designed, it must often rely on fundamental data that should never change. For example, both the political party candidate database and the vote tabulation and allocation software database rely on the list of municipalities as it is the key to organizing both the data input and the data output. This list, however, was constantly changing. Each time that the decision was made to add, modify, or delete a municipality, all of the data that had been linked to the changed municipality had to be manually reorganized to accommodate the changes. These frequent changes consumed a lot of developer time and increased the chances that errors could occur. In the future, IT should not allow any application to be used, or even begin development, until reasonable assurances are given that the underlying data will not be changed.

6. A related problem included situations where data needed to be collected was often unregulated. It is important for the design of the database that the developer know exactly what data will be collected and how it will be collected. The best example of this lack of regulation was the registration of political party candidates and coalitions. Quoting from Todd Penland's trip report, "The likelihood that a database application will be developed in a reasonable amount of time and with reasonable assurance that the data will be useful depends heavily on the consistency in the way the source data is presented. In this case there was no such consistency. Parties were permitted to register separately, as members of coalitions, and/or separately but as members of unnamed coalitions. Parties were permitted to present lists of candidates which were empty, did not contain sufficient data to positively identify candidates during the verification process, and/or with both Latin and Cyrillic characters in candidate names - a situation which cannot exist in an *Access* record due to the formatting restrictions built into *Access* itself. Parties were permitted to amend their lists of candidates even after the cutoff dates for such critical reports as candidate verification and poster proofs had passed."

7. Another significant problem encountered was that of form design. Both Voter Verification and Political Party Service Departments used forms to collect large amounts of data that had to be processed by IT. The forms were so poorly designed, from an IT perspective, that sometimes the data could not be processed. This problem resulted from the forms being designed without consulting IT first. Any forms that will need to be processed by IT, must be approved by IT in advance of their being printed. A consultation with IT should also occur anytime that its services will be required to complete an activity. Careful attention should be paid to this issue to avoid the familiar "Garbage in, Garbage Out."

8. A technical problem experienced was that of multiple instances of a table. The best example of this was the municipality data. This data was used in various databases. Each time that it was needed for a new application, it was copied as a table into the new database. This created multiple copies of the municipality data. Each time that the municipality data changed, which was often on a daily basis, there was a high likelihood that one or more of the multiple municipality tables would not be updated. A solution to this problem would be to have only one municipality table on the network file server that is then linked to all databases that need it rather than importing the table into each new application.

9. Another similar problem was that of multiple instances of a database. Due to severe time constraints, it was necessary to assign different developers to work on a database at different times. This usually occurred whenever someone called with an urgent request to make a modification to a database and the task was assigned to whoever was least busy with other urgent tasks. Normally, the

ideal would be for one developer to work on the same application from start to finish. When a developer was asked to work on a database that had already been worked on by another developer, it was common to create a local copy on a hard drive. Each time this was done, another version of the database had been created and eventually it was hard to tell which was the current or most complete version. Once again, the databases should be located on the network file server, and only one copy should exist.

10. When creating databases that must represent multiple languages, their handling is critical. In the Bosnian context, where most items needed to be represented in four languages, the most effective method would be to create a field in the database for each language rather than separate language databases. This saves the trouble of reentering numeric or Boolean data, which is unaffected by the language used. This structure also tends to enforce data consistency and integrity.

11. When working with multiple languages it is also important to take into account the data entry operation. Because the Local Election Commissions were hopelessly behind in identifying polling place locations, IFOR and IPTF (International Police Task Force) were asked to assist. They collected the data in English. However, the data entry clerks, who were hired to type and not to translate, didn't speak English. This caused a tremendous slowdown in the process due to slow entry and a large number of errors that had to be manually detected and corrected. Once this data had finally been entered, it then had to be translated back into Bosnian so that it could be used by the LEC's and polling place staff.

12. It is important that an accurate assessment be made of the hardware and software that will be necessary to complete a task, and that it be made available. When Mr. Miller arrived to prepare the Voters List of 3.5 million records, he found that all he had was *MS Access* and a low end desktop PC. *MS Access* is designed specifically for peak operation with no more than 50,000 records. It is obviously capable of working with much larger record numbers, but the time required to affect a global manipulation of the data goes from minutes to days. This was further hampered by the lack of a proper PC with sufficient RAM and hard disk space.

13. The core of the database and software development team should be staffed early on in the election period to allow developers to become familiar with the election procedures and anticipated schedules. This would also give the development team adequate time to become acquainted with each member's strengths and thereby work together in an efficient, effective manner. Core members of the team should possess expertise in the selected software platforms in that tight scheduling does not allow for much learning time. The software development team should always be very aware of election time lines so that applications are delivered on a timely basis.

XI. SUMMARY

The IT staff in Sarajevo was charged with the development and maintenance of the IT Department which included a number of basic, yet necessary components which are delineated below. In addition to their roles as managers, advisors, developers and technical support personnel, the IFES IT team became a key member of several sub-Missions within the OSCE which included supporting the OSCE Media Center and developing a series of databases not originally envisioned by the OSCE but deemed essential to the impact of the OSCE Mission.

IT Staffing: The entire OSCE IT Team was made up of 20 international specialists including an IT Support Manager, 5 "Help Desk" Technicians, 2 Network Administrators, System Developers, Senior Technical Representatives, Data Verification Clerks, and three Data Entry Supervisors. This international staff was supplemented by two shifts of 48 data entry local staffers tasked with the monumental task of inputting data such as public voter registration alterations, inventory and commodity coordination, and party/candidate registration databases.

OSCE Network Development: IFES led the OSCE in the development of an IT Network infrastructure which provided cohesion between the OSCE HQ and its subordinate offices in the city of Sarajevo. In addition, IFES took the lead in coordinating the establishment and support of computer equipment procured by OSCE-Sarajevo which was then used by more than 200 international OSCE staffers.

OSCE-Sarajevo Internet Connections: The IFES-led IT team, under the leadership of Jim Miller, placed a high priority on the installation of a fully functional Internet (e-Mail) system, including Internet addresses for key OSCE personnel. IFES staff, in cooperation with the OSCE, submitted a technical proposal to provide Internet access through a Microsoft Business Partner based in Hungary. Upon approval by OSCE, IFES was able to connect the OSCE's five computer networks in Sarajevo to the University of Sarajevo which then in turn connected to an Internet Mail-Service Provider in Vienna.

Data Entry - State Statistical Institute: The IT Team became fully operational at the Statistical Institute in July for all Data Entry and Software Development purposes. On the first full day, the Data Entry staff was able to key in nearly 10,000 completed Voter Registration Forms. IFES' Jim Miller reported that the IT Team, with the support of the two shifts of 48 local data entry personnel, had the capacity to input 75,000 Partial Forms per day, capturing essential Voter Registration data, including the form's serial number, the voter's name and identification, their 1991 Opstina (voting location), and their current Opstina. The IT Division, under IFES' management, added an additional

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10 workstations and 20 new data entry people (10 for each shift). IFES completed all Voter Registration Form input by August 12 using the 100-person local staff. The IT team stated that all backlogged voter registration forms would be input by the 100-person local staff by August 12. Preliminary numbers from the Statistical Institute were:

FORM #1 REQUEST SUMMARY	COUNT (Aug. 5, 1996)
To Have Name Added to the Provisional Voters List	35,395
To Have Name Changed in the Provisional Voters List	33,578
To Vote by Absentee Ballot in the Municipality who had been Registered in 1991	140,960
To Have Name Deleted From the Provisional Voters List	36,812
To Vote From Address at Which Resident Between 1991 Census and April 6, 1992 in Person or by Absentee Ballot	14,000
FORM #1 TOTAL	260,745

In addition to backlogged requests from individuals either displaced or requiring edits to their current status, the IT Mission, in coordination with the IFES-developed World Wide Web Site team, developed a system by which refugee applications (extended through August 8) were downloaded in Vienna (at *EUNet*) by the OSCE and delivered to the OSCE's Statistical Institute for database input. This allowed the WWW to be used by refugee populations (accessed by humanitarian organizations) to request that OSCE Forms be sent to them so they could register to vote. This was the first time that the WWW had been used in such a manner.

Database Development - Political Party/Coalition Candidate System: The IFES IT Team directed the development of a Political Party Database which was completed and fully operational by July 1996.

Polling Place Database: The OSCE Polling Place Database was also completed but required unanticipated maintenance due to the ever-changing number and location of Opstinas and polling places. Upon completion of these databases, Camera-ready proofs (A3-size) posters were produced



(by Opstina) listing locations of regular and absentee polling places.

Election Monitors Database: The OSCE's CIM Division was very enthusiastic about the Election Monitor Database program and returned several times to the IT staff to have additional features added. Great interest was expressed by several organizations and individuals handling observer logistics in obtaining a copy of this program for use in future elections.

Media Center Support: The IT Team began work on the Media Center in August 1996 to provide immediate election results to an estimated 2,500 journalists. The Media Center was a "new requirement" deemed necessary by the OSCE (based on an earlier IFES technical proposal) which allowed worldwide visibility. Supporting this Center was a network to handle the vote tabulation with results presented graphically. Updated results were shown every 15-30 minutes on a series of large screen TV monitors throughout the Center. The IT staff designed this presentation which displayed timely election results on the OSCE WWW Site developed by IFES with funding from ODIHR (www.oscebih.org).

Under the coordination of IFES' Todd Penland, a prototype of the graphical results presentation was completed which included sample tables and graphs illustrating simulated results of Presidential, Representative, Cantonal Assembly races, as well as examples of the type of animation planned in the final version which included a vote tabulation system. A seat allocation program was completed by September 6 as was the final prototype of the *MS Access/MS Excel/MS PowerPoint* presentation system.

XII. IFES IT ACTIVITIES FOR THE 1997 MUNICIPAL ELECTIONS

Beginning immediately after the September 1996 National Elections, IFES' Roger Plath and Fitzgerald Jean participated in a series of meetings with the OSCE as it planned for the upcoming voter registration process. This requires a completely new voter registration, but still uses the 1991 Census as the basic document which established an eligibility to vote. It is planned that laptop computers will be used at all Registration Centers to assist people in finding their names. Mr. Plath began developing a preliminary plan for voter registration and identifying the required equipment. A draft registration form was created and reviewed by the Elections Group, and the new Director for Registration.

Unlike the 1996 National Election database process, IT has been included in identifying vendors and developing specifications for the procurement of equipment. IFES, through Mr. Plath, participated

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in a series of planning groups which is developing detailed plans including timelines and IT Department staff requirements.

Due to the fact that the 1991 Census database is extremely large, slow, and cumbersome, Fitzgerald Jean has optimized its design and created a new and more rapid search function that utilizes logic techniques allowing the search to find voters more often, despite the poor quality of the data, by finding names that are not only exact matches, but also those that are similar, but not exact, due to misspelling or incorrect name order. This optimization will allow more voters to find their names, and will be significantly faster to accommodate the large number of voters who must register.

The new voter registration activity (scheduled to begin in May 1997) will also require a new database to contain the results. Fitzgerald Jean will design and test this database, and design the interface between the registration form scanning equipment and the database. He is also investigating the possibility of designing the database to correctly handle the Serbo-Croatian alphabet, unlike the 1991 Census which used a standard American character set, allowing sorts, searches, and queries at a faster pace and more productive.

In January and February of 1997, IFES' IT Director Roger Plath continued to work on all aspects of the voter registration plan. Mr. Plath received a first draft of a Voter Registration Form. The draft was passed on to the Director of Voter Registration who reviewed it in conjunction with a working group of Election Officers.

The following tasks are a representation of tasks which must be completed by the IT Department in 1997 before the Municipal Election Voter Registration begins:

- Receive final release version of the 1991 Census database and "search engine";
- Integrate Bosnian/Serbian/Croatian translations into the "search engine";
- Configure and install the 1991 Census software and extra batteries on all 580 laptops;
- Produce instructions for use of laptops and 1991 Census database;
- Design new voter list database including the use of Cyrillic with the desired output;
- Relay all database information to Out-of-Country Voting Office in Vienna;
- Receive, configure, and link all OMR scanning machines to a new database;
- Develop a plan for the ongoing verification of the accuracy and integrity of the voter registration data (primarily through scanner-level and database-level data validation); and
- Design new, or modify previous polling place database.

It should be noted that due to the success and capability show by the IFES IT Team since Spring of



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1996, the level of the Department's responsibility has now been expanded to the point that the Sarajevo-based IT Department is charged with all IT activities for the entire OSCE Mission including staff outside the Elections Unit.

XIII. CONCLUSION

The September 1996 elections, from an IT perspective, were far from perfect but still quite successful. Too much of the information the team had to work with was of poor quality and the phenomenon of "garbage-in, garbage-out" was a constant battle. In addition, the IT Department became a convenient scapegoat for too many people in the OSCE Mission. The team did manage, however, to accomplish the most important tasks, meet the most important deadlines, and complete the elections process.

It is unfair to expect the IT Department to solve all administrative problems. In fact, administrative problems tend to surface while in the process of automation. This difficulty is only compounded when under a great deal of pressure and constantly facing approaching deadlines. What an IT Department does requires a significant amount of hard work, very exacting instructions, well thought-out requirements and considerable time. The IFES IT Team, in coordination with hard working local staff, IFOR, and OSCE technicians made the best out of constantly changing instructions and requirements. In a team member's report it was stated that "...we did a years worth of work in four months." However, another team member expressed a common sentiment in stating, "To me this [mission] was a success for which I am proud to be a part of, and am glad to place my signature."

APPENDIX A

**ELECTIONS IN BOSNIA AND HERZEGOVINA
INFORMATION TECHNOLOGY STATUS REPORT
BY MICHAEL YARD
MAY 10, 1996**

**International Foundation
for Election Systems**

ELECTIONS IN BOSNIA AND HERZEGOVINA

Information Technology Status Report
May 10, 1996

Elections in Bosnia and Herzegovina

Information Technology Status Report

Executive Summary

Information Technology Requirements

There is an urgent need for immediate attention to the Information Technology requirements of the OSCE Mission to Sarajevo. Information Systems are required for:

- Voter Registration Database
- Inventory of Sensitive Documents (Registration forms, ballots)
- Inventory of Consumables
- Personnel
- Monitor Accreditation
- Supervisor Logistics
- Results Calculation and Seat Allocation

In addition, there is a need for hardware and software installation support, network installation and administration, client/server database setup and administration, and help desk support for computer users throughout the mission.

State of Information Technology Preparedness

Data from the 1991 census has been converted from the mainframe database to Microsoft Access. It can easily be converted from this format to a client/server architecture required for data entry and validation. Most of the desktop and laptop computers have been ordered and have arrived or are in transit. Microsoft has agreed to provide software as well as installation support.

There are, however, many tasks remaining to be accomplished in a short timeframe. Network creation is in its infancy, with file servers, network interface cards, hubs, cabling, etc. not yet ordered. It is hoped that network installation specifications can be completed and that all networking hardware can be ordered early in the week of May 13.

A number of management issues also threaten completion of required information systems. Local Election Commissions in the 112 Municipalities have not yet been identified, and fewer than half the 26 OSCE field offices responsible for overall supervision of the electoral process have been opened. Polling Station boundaries have not yet been defined, and fewer than half the Municipal offices have been opened. Plans for data entry call for 150 typists, but the Director of the Statistical Institute responsible for providing this labor force, reports that he can only provide 30. The Provisional Voters List is printed in a seemingly random order making it difficult to locate an individual's name. Most street names throughout the country have been changed since the 1991 census, and it is unclear whether voters are required to apply for a change of address. Likewise, there are many errors in the names listed in the

Elections in Bosnia and Herzegovina

Information Technology Status Report

Background

In response to requests by the Department of State and the OSCE Mission to Sarajevo, International Foundation for Election Systems (IFES) asked Michael Yard, the IFES Technical Manager in Ghana, to visit Sarajevo, BiH to do a Requirements Analysis and Assessment of Information Technology Preparedness. This report summarizes the assessments and recommendations based upon this Requirements Analysis.

It is assumed that most recipients of this report are already familiar with the Dayton Peace Agreement, and with the responsibilities of OSCE with regards to elections in Bosnia and Herzegovina. For the sake of completeness of this report, a fact sheet summarizing the agreement is included as an appendix for those requiring this background information.

Information Technology Assessment

Although the request for this Requirements Analysis specified a focus on the IT needs for production of a Voter Register, I discovered early in the process that there is a need throughout the mission for a greater focus on IT. With a broad consensus of persons interviewed this assessment extends beyond the needs for a Voter Registration database, and touches upon other IT support required for the efficient operation of the mission. In the absence of this support the orderly supervision and conducting of the Voter Registration exercise is impossible. For the purposes of this report we will begin with the need for a Voter Registration database, then proceed to touch upon other requirements.

Voter Registration Requirements

Voter Registration Database

The Agreement allows voting rights to all citizens of Bosnia and Herzegovina aged 18 or older listed on the 1991 Bosnian census. The starting point for the database is the census data. This data has already be transferred from the mainframe computers of the Statistics Institute to a PC at OSCE mission headquarters, and a Provisional Voters Register has been printed from this data. During registration exercises citizens will have the opportunity to request any of the following changes to the registration data appearing on the provisional register.

- Add name
- Change name
- Delete name
- Address change
- Request absentee ballot
- Change Municipality

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EXECUTIVE SUMMARY**

census data (attributable to the optical character scanners used), and it is unclear whether voters should apply for a name change if their name is listed incorrectly.

Recommendation

A number of options have been identified and are being discussed in response to problems with the currently planned voter registration process. It is imperative that any decisions regarding changes in policies and procedures be reached quickly to allow time for creation and implementation of appropriate support systems. Regardless of changes, there is a requirement for Information Technology staff to create and maintain the necessary systems. The following additional staff are required:

- 1 Networking engineer for a period of 5 days. (needed immediately)
- Chief Technical Manager to remain throughout the project (16 weeks)
- 3 Windows NT Administrators, 1 of whom remains throughout the project (16 weeks), with the other 2 available during the data capture period (6 weeks).
- 3 SQL Server Database Administrators, 1 of whom remains throughout the project (16 weeks), with the other 2 available during the data capture period (6 weeks).
- 3 Microsoft Access developers for a period of 4 weeks.

If a decision is made which eliminates the requirement for a Voters Registration database, the following staff will still be required to implement other necessary systems:

- 1 Networking engineer for a period of 5 days. (needed immediately)
- Technical Manager to remain throughout the project (16 weeks)
- 2 Windows NT Administrators, 1 of whom remains throughout the project (16 weeks), the other available for a training period for a local replacement (6 weeks).
- 2 Microsoft Access developers, 1 of whom remains throughout the project (16 weeks), the other available for the time required to create and startup required database systems (4 weeks).

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A Transaction Table will be kept to record all such requests, and whether the request was approved or denied.

Two additional transaction types may appear in the Transaction Table, as follows:

- Challenge
- Appeal

In case of either a challenge or appeal, appropriate information will be entered into the transaction table, including a status code indicating whether this voter's name should be included in or omitted from the final voter list.

After all data has been captured from the registration, a new Voter Registration table will be generated from the Census table and the Registration Transaction table. This Voter Registration table will incorporate all data from the Census table and all additions, changes, and deletions from the Registration Transaction table. This table will be used to print the official voter register.

Geographically, a boundary line has been established, dividing the country into the Federation of Bosnia and Herzegovina, and the Republika Srpska. These two entities are further subdivided into 112 Obstinas (Municipalities). (It is possible that, for purposes of the election, the number of Municipalities may expand to as high as 161.) A table will store data on each Municipality including a Municipality Code and Name of Municipality. The Municipality Code will be used in all other tables requiring geographical identification. At this time no further geographical boundaries have been established. The two entities, Federation of Bosnia and Herzegovina and Republika Srpska are charged with the responsibility of establishing boundaries for 4,000 Polling Stations, but these have not yet been defined.

To monitor the Voter Registration process, three additional tables will be created. The first is a Daily Accounting table which will contain information on the Voter Registration forms used each day in each Municipal office. A Violations table will include all reported violations during the registration process. A third Violation Category table will be used to define meaningful categories for classifying types of violations. This will ensure consistency in classification, allowing reports of violations to be generated, grouped by category.

Problems with designing a Voter Registration system

Two significant problems exist with regard to the Voter Registration database. The first is that although plans call for printing the Voter Register by Polling Station, this cannot be accomplished unless Polling Station boundaries are established before the start of the registration process. This problem will be treated in more detail later in this report.

The second problem with any design for the Voter Registration database is realistic time requirements for data capture. Initial plans called for 150 data entry persons to be employed by the Statistical Institute to do the data capture, but the Director of the Statistical Institute has indicated they can only provide 30 experienced typists. Estimates for data capture of 1 million transactions range from 9 weeks (assuming 150 data entry personnel), to 58 weeks (assuming 30 data entry personnel which the Statistical Institute says they may be able to provide). Estimates for number of transactions ranges from 1 million to 3 million. Based upon these figures, even the most optimistic timelines for data capture, processing, and printing of a Voter Register would risk missing the deadline for a September 14 election date.

Voter Registration Management Systems

For managing the Voter Registration process, systems will need to be established for recording information about Municipal Offices, Personnel, Payroll, Inventory and

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Logistics. At the present time only none of the 112 Municipal offices have been established and it does not appear that any work has been done to create the necessary information systems required to conduct an orderly registration process within these offices.

Other Information Technology Requirements**Installation and Maintenance**

136 desktop computers are currently in use. An additional 82 have been ordered. 82 to setup 8 to 8 systems per day, assuming 6 hours for setup, a configuration. (Although each system takes approximately 6 hours for setup, a technician can set up several systems concurrently. With a total of 255 systems, a single technician would take 30 to 40 days to complete installation and setup. Staffing requirements for meeting this demand are discussed under "Proposals" later in this report.

Help Desk Support

Repeated testing of Windows 95 has indicated that most users are capable of becoming productive in a shorter time period than with any previous version of Windows. This same benefit extends to use of the Microsoft Office suite of applications. Still, users will have questions and problems on a regular basis, and adequate staffing will be required for helping to resolve these problems. At present there is a steady stream of users walking into the IT Manager's office requesting help with software, printers, monitors, etc., and this need will grow considerably in the coming weeks. Additional staff to meet this demand is discussed later in this document.

Inventory and Logistics - Security Documents

Voter Registration forms should be treated as security items, the same as ballots. A database system is required for tracking distribution and return of all forms, and for applying consistency checks between the number of forms reported used by each Municipal office, and the actual number of transactions recorded.

Inventory - Consumables

Inventory of items kept in the storeroom at headquarters is currently being done manually. The system being used seems to be adequate for the current level of need, but a more complete inventory database may be required to manage the flow of consumable supplies in the coming weeks.

Personnel

A list of Personnel is currently being kept up to date in Microsoft Word within the Personnel office. Another list is kept on paper for tracking issuance of ID cards for security. Yet another list is being kept for tracking the issuance of computers. A fourth list is kept by the communications office for publishing the directory. All of these lists

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begin with the list kept by the Personnel office. At this present time this system seems to be working acceptably, but a centralized personnel database might be desirable to allow easier sharing of information and consistency between the different functions requiring this information.

Monitoring & Accreditation and Supervisor Logistics

There has been some discussion concerning a need for a database system to track accreditation of Human Rights Observers, and another to assist with logistics of Election Supervisors. A distinction is made between Supervisors, who are employed by OSCE and have the right to intervene in the election process, and Observers who are to remain impartial and report any irregularities. It is unclear whether OSCE will be required to provide Database and Logistical support for Observers during the registration and the election, but it is most probable that a database will be required for tracking Supervisors.

Candidates

A database system will be required for tracking registration of Political Parties and Candidates, including qualification, which election and what office running for, and to assist with printing of ballots. A procedure should be established for comparing the list of candidates with the list of persons indicted by the war crimes tribunal, as such persons are by definition disqualified from running for office if they have been convicted, or have failed to appear before the tribunal.

Results

A system will be required for calculating results, allocating seats in the Houses of Representatives, and disseminating results to the press. A paper written by John Reid describing seat allocation calculations is attached as an appendix to this document.

State of Information Technology Preparedness**The Good News**

The transfer of the data from the 1991 census into a format accessible from any Windows database is a significant accomplishment which took much dedicated effort. This data has been formatted as a Provisional Voter List and has been printed. The data has also been converted to a form which will require only minor modification to serve as the basis for a relational Voter Registration database.

Most of the desktop and laptop computers required for the operations of the mission and for the data entry of Voter Registration transactions have been ordered, and most are in transit at this time. Microsoft has approved the request for donation of software and installation technicians, and the software is scheduled to arrive by May 14. The technicians are yet to be scheduled, pending arrival of all necessary equipment and completion of space to install the equipment.

The Bad News**Hardware and Software Procurement**

Fileservers have not been ordered due to a failure of the selected vendor to provide a guaranteed delivery date. It is anticipated that the fileserver order will be placed this week, but they will not arrive in time to be used to help with installation and upgrade of software on the PC's and laptops which are already here or arriving in the next week. The process of installing software on individual PC's is much more efficient from a Windows NT network. It may be possible to place one of the desktop PC's into service

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as a "temporary fileserver", but it is not yet clear whether they will be capable of running Windows NT. It is also unclear at this time whether the file servers will arrive before required for Voter Registration data capture. And when they do arrive there will be a several days of preparation required to install Windows NT and SQL Server, and to develop the database to support data capture.

There is one fileserver in Operations. Novell Netware is available for installation on this server which is needed immediately. It would be preferable to install Windows NT for compatibility with the future servers, and to eliminate the additional overhead required to administer a Novell network as well as the Windows NT network, but the Windows NT software will not arrive for another week. The IT Manager for Operations is being pressed to put the fileserver into immediate service; this will force a decision a week or two down the road whether to support two network operating systems or to change the installation from Netware to Windows NT. It also appears an inadequate number of Windows NT licenses may have been requested from Microsoft to allow installation on the Operations fileserver and the three file servers which have not yet been ordered. It is possible that one of these file servers may replace the one in Operations, eliminating the need for additional licenses; if not, an additional license should be requested.

Network interface cards were not included in the specifications for the desktop computers, nor have they been ordered. Again, it is anticipated that the order will be placed this week, but when the cards are received there will be many hours of work to install them in the PC's and to configure and test the network protocols.

Specifications have not been developed for network installation. A network engineer should be contracted immediately to survey the sites and develop specifications for required hubs, cabling, connectors, terminators, etc. for networking all PC's.

An inadequate number of UPS units were ordered. The additional requirement should be determined immediately and the order placed.

Installation and Setup

No space has been assigned for storage of incoming computer equipment. Though space is available, it will require some preparation time to make the space ready for receiving.

There is a discrepancy between the software installed on existing PC's (Windows 3.1, Office 4.3?) and the software being donated by Microsoft for all PC's (Windows 95, Office for Windows 95). This will require that software be upgraded on all existing PC's or that support be provided for two sets of software. Maintaining two different sets of applications software could lead to "codepage" incompatibility between documents which need to be shared among coworkers. (NOTE: Prior to Windows 95, support was not provided for the Latin characters used by the Bosnian language. Consequently, a work-around was developed which assigned these characters to ASCII codes normally used for graphics. Windows 95 supports the required character set via codepage 1280, allowing much faster data entry. However, there will be an incompatibility between documents written under Windows 3.1 and those written under Windows 95. A macro can easily be developed to perform the required translation.)

Information Technology Staffing

There is a pressing need for a full IT Department to support mission operations. The IT Manager for Operations is very capable, but he cannot provide installation and support services, install software upgrades, serve as 24-hour network administrator, database administrator, trainer, help desk, etc. Recommendations for international staffing are included in this document; local staff requirements have been discussed with the IT Manager for Operations, Strategic Planning Officer, and IT Manager for Operations.

**ELECTIONS IN BOSNIA AND HERZEGOVINA INFORMATION STATEMENT
EXECUTIVE SUMMARY**

Elections Management Issues

Polling Station boundaries have not been defined, nor is sufficient geographical information being collected on the voter registration form to allow subsequent assignment of a voter to a specific polling station. Yet, it has been requested that the Voter Register be printed by Polling Station. This cannot be done without defining all 4,000 Polling Stations and modifying the registration forms before registration begins. Even then Polling Stations could not be assigned to persons who are eligible to vote, but do not come to register.

The Provisional Voters List was printed in a seemingly random order. Although there may be some logical ordering of the names on the list I was unable to determine the order. It is probable that the average voter looking for his/her name on the list may also have problems determining the order of the names, and therefore will be unable to find his/her name.

The plan for data entry calls for 150 data entry personnel to work in 3 shifts of 50 in order to capture all required registration data. The Statistical Institute has indicated that they cannot provide this many typists. When pressed for how many typists they could provide, the Director said he couldn't be sure until they have established a pay scale and advertised the positions, but finally made a guess that they might be able to provide 30.

Most street names in Sarajevo have been changed in Sarajevo and other cities in BiH since the 1991 census. It is unclear whether all voters are required to apply for an address change as a result of these changes.

The Batch Form designed for Daily Accounting of Registration Forms does not allow for recording damaged or spoiled forms. This information is required to allow consistency checks between the number of forms used in each Municipality and the actual number of voters registered.

Options

The following section is an attempt to catalog as many available options as possible in the limited time and space available. These options will focus on the two most significant problems identified: the inability to produce a Voter Register by Polling Station and the lack of a viable strategy for data capture. No attempt is made to place any value judgment on the options; no option listed is without merit, nor is any option listed which is without flaws. It is hoped that perhaps this listing may help inspire additional, more valid options.

Problem: Inability to print Voter Register by Polling Station - Options

Option 1: Wait until all Polling Stations have been defined before starting registration, then proceed with currently planned procedures. This would allow assignment of Polling Station at the time of registration, however the delay would almost certainly necessitate a postponement of the election date.

Option 2: Proceed as planned, with registration at Municipal offices. Print entire Municipal register for each Polling Station. This would require almost 40 times as much paper as printing a list for each Polling Station showing only the voters registered at that Polling Station, but it would provide poll workers with a list of all potential voters at each Polling Station.

Option 3: Wait until all Polling Stations have been defined. Then have a manual registration process as follows: each qualified voter completes a registration form. Forms are printed in triplicate, so this produces 3 copies of the registration data. The

**ELECTIONS IN BOSNIA AND HERZEGOVINA - INFORMATION STATUS REPORT
EXECUTIVE SUMMARY**

first copy is given to the voter as a receipt. The second is forwarded on to Sarajevo. The third is kept at the Polling Station where it is inserted in a binder along with all other registrations. This binder can be used on the day of voting as a Voter Register for that Polling Station.

Option 4: Post maps of every city, town, and village in each Municipal office. The maps could be divided into a grid, with each section of the grid numbered. During registration, the voter would identify the grid nearest to where he/she wishes to vote, and would write that number on the registration form. At a later date, Polling Stations could be established for each cell on the grid. Some grids might require multiple Polling Stations to handle the volume. Voters who do not register would not be assigned to a particular Polling Station, so each city would also require a central Polling Station where non-registered, eligible voters could cast their ballots.

Option 5: Do voter registration, but only send forms to Field Offices for audit and verification of compliance. In order to comply with Dayton, voters who do not live in the Municipality where they are casting their vote could be asked to fill out a declaration of intent to live in that Municipality. To eliminate the possibility of a person voting multiple times, electoral stain could be used or the voter's ID card could be marked at the time of voting. No central update of the voter register would be required.

Option 6: Trust people to be honest. There will always be people who try to violate the rules, but it may be determined that there would be too few violations to influence the outcome of the election.

Data Capture: Inability of Statistical Institute to provide adequate staffing

It should be noted before listing options that all calculations of time required for data capture are conjecture since no tests have been performed to determine the actual time required for an average typist to enter and verify data on the forms. Also, a number of "data verification" procedures have been discussed, but no solid plan has been defined. It is recommended that tests be conducted as soon as possible to determine more accurately the amount of time required to complete entry of each form, and to perform data verification using each proposed method. A data model is included as an appendix to this report giving 4 different models for estimating time required to complete the data capture.

Option 1: Proceed with 30 data capture personnel. This could take more than one year to complete data capture.

Option 2: De-centralize data capture by distributing computers to each of the regional centers. This would provide a broader geographic base for recruiting data capture personnel which might enable the recruitment of the required 150. However, it also increases the risk of fraud, the supervision overhead, and creates the problem of making the existing census data available via network to multiple locations, a significant increase in IT workload.

Option 3: Use high-speed Optical Mark Recognition scanners. These have been used successfully for Voter Registration in Ghana and Sierra Leone, allowing data capture speeds averaging 4,000 forms per hour. However, several weeks of feasibility studies were done in each of these countries to determine whether the average voter could accurately complete the OMR forms, and the lead time for printing the forms in significant (estimated 6 to 8 weeks).

Option 4: Export the job of data capture. There are companies available in other countries who perform data capture on a contract basis. It is uncertain how long it might take to locate a suitable company, work out the contract details, and ship the approximately 8 tons of paper.

Sources

U.S. Department of State, Summary of the Dayton Peace Agreement on Bosnia-Herzegovina, Fact Sheet Released by the Office of the Spokesman, November 30, 1995.

OSCE, Elections in Bosnia and Herzegovina: An OSCE Appeal for Voluntary Contributions

OSCE Mission to Bosnia and Herzegovina: Mission Members Manual

Sir Kenneth Scott, Deputy Head of Mission - Elections, OSCE BiH

Per Sjogren, Director General for Elections Administration, OSCE BiH

Hon. John M. Reid, P.C., Member, Provisional Election Commission

Judy Thompson, Director General Elections, OSCE BiH

Pat Ewashko, Strategic Planning Officer, OSCE BiH

Peter Hoffman, Chief Mission Support Section, OSCE Vienna

Dragisa Vukajlovic, IT Manager - Operations, OSCE BiH

Christian Christenson, Director of Voter Registration, OSCE BiH

Nugzar Kakhniashvili, Chief of Personnel Office, OSCE BiH

Maj. Atanas Christov, Chief Communications Officer, OSCE BiH

Goran Rudic, Logistics Assistant (supply room) , OSCE BiH

Prof. Dr. Zolic Hasan, Director, State Statistical Institute

Ed Van Thijn, Coordinator for International Monitors, OSCE BiH

Lo Breemer, Chief of Staff, International Monitoring, OSCE BiH

Stefanie Luthy, Election Observer Officer, OSCE BiH

Stefan Mueller, Human Rights Monitor, OSCE BiH

Arjuna Kannangara, Special Assistant to Deputy Head of Mission - Elections, OSCE BiH

Philipp Schenkl, Information Technology Officer, OSCE Vienna

ELECTIONS IN BOSNIA AND HERZEGOVINA - INFORMATION STATUS REPORT

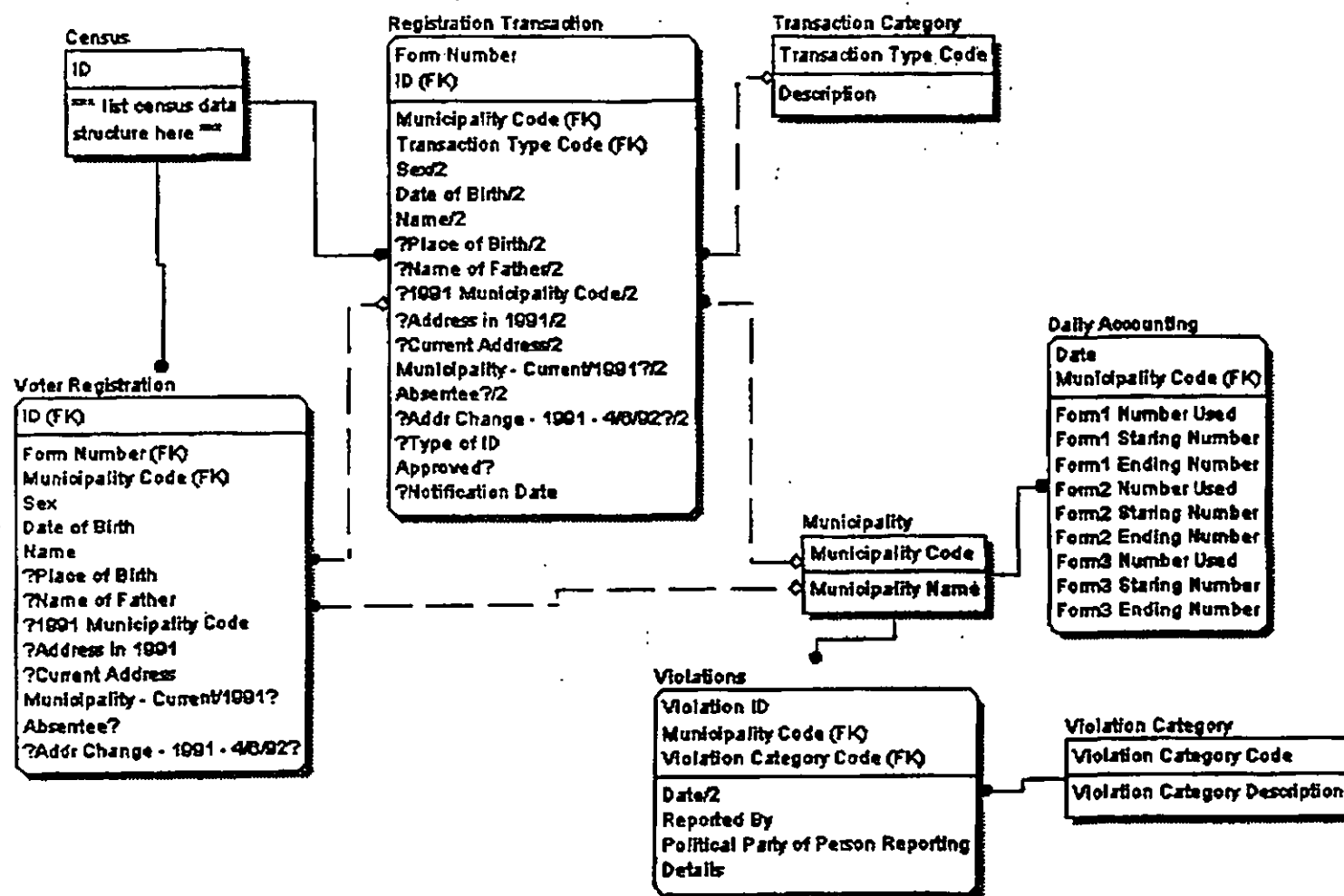
Appendixes

Appendix A: U.S. Department of State, "Summary of the Dayton Peace Agreement on Bosnia-Herzegovina", Fact Sheet Released by the Office of the Spokesman, November 30, 1995.

Appendix B: Entity Relationship Diagrams detailing data structures required for Voter Registration, database

Appendix C: Paper on Proportional Representation Calculations

Voter Registration Database - Entity Relationship Diagram



APPENDIX B

**ELECTIONS: BOSNIA AND HERZEGOVINA
INFORMATION TECHNOLOGY STATUS REPORT II
BY JAMES MILLER
JUNE 6, 1996**

International Foundation
for Election Systems

Elections Bosnia and Herzegovina

Information Technology Status Report

June 6th, 1996

By: Jim Miller

Introduction

The following report will detail the current state of affairs concerning the Information Technology capabilities, requirements, and recommendations with respect to supporting the Elections planned for Bosnia and Herzegovina on 14 September 1996.

Executive Summary

The information processing capabilities are approaching a critical point with respect to the requirements needed to support the September elections. The most urgent need at this time is to implement the Networking plan that will allow for the Information Technology (IT) infrastructure to be put in place. All subsequent systems, and software development will then be built on this important foundation. Until that time, crucial functions such as Database Development, Management Reporting, Data Entry, Electronic Mail, and overall Systems Design will be hampered at best, or halted at worst.

Once the Networks are in place, a great deal of Software development will then need to be put in implemented. The Provisional Voters List (PVL) will need at least a partial update to more accurately reflect the BiH electorate, allow for candidate verification, provide an accurate ballot count by municipality, and permit the statistical analysis of election results. Another question concerns the determination of polling locations for registered voters, and what requirements may be placed on the IT group for this item. Other areas for Systems Development include:

- Refugee Voter Registration
- Political Party and Candidate Registration
- Inventory Of Sensitive Documents
- Consumable Inventory
- Personnel
- Monitor Accreditation
- Supervisor Logistics
- Vote Result Calculation And Seat Allocation

Elections (IT) Staffing

Staffing requirements should be finalized after the 'Design and Analysis' of the above mentioned systems is completed. However, understanding that this may not be possible, my current recommendation for staffing the OSCE BiH Mission - Elections IT staff would be:

- Chief Technical Manager to remain throughout the project
- 1 Director of Systems Development to remain throughout the project
- 1 Windows NT Network Administrator to remain throughout the project
- 1 SQL Server Database Administrator for a period of 4 to 8 weeks
- 4 Microsoft Access Database Developers for a period of 4 to 8 weeks
- 1 Help Desk Technical Support Manager to remain throughout the project
- 4 Help Desk Support Technicians (two for 8 weeks, two for entire project)

Detailed Status Report

Part 1 - Networks

IT Systems Infrastructure

The Local Area Network's (LAN's) required as infrastructure to the election system development effort is now a critical need that requires immediate action. As the election's time line continues to progress, more and more demands will be placed on a system that is entirely inadequate. The Network's must be in place before any serious attempt is made to accommodate IT requirements needed for the elections.

There are two (2) Networks in the plan. One is to be located in the OSCE Mission to BiH in Sarajevo that will connect the Administration building, and the Bank building which houses the Elections group. The second network will be located at the Statistical Institute to be used for data entry, and potentially some systems development.

Network Planning

The single biggest problem that I see with respect to the Network is the lack of an individual who is tasked with the 'Big-Picture' and who will be responsible for the network, and systems from beginning to end. To date, people have addressed these issues from a somewhat detached perspective, for a variety of reasons, with predictable results.

Delivery Problems

Obtaining the basic building blocks to a network; cabling, interface cards, hubs, servers, etc., continues to be problematic. Changes to the network plan, performed in isolation, is a part of this problem. This has resulted in orders that have not been placed, and resources that have not been scheduled (i.e. Network Engineers). However, even when network components *have* been ordered, there appears to still be great difficulty in receiving the pieces here in Sarajevo. A higher degree of importance needs to be placed on this procurement cycle.

Personal Computer (PC) Inventory

Attachment 'A' details the PC's that have been planned, delivered, and the difference between the two. This list is maintained by the IT Manager Operations; Dragisa Vukajlovic. There is some question as to where all the computers are installed. This is primarily due to the equipment passing from one individual to another without a paper trail. Another issue is the budget (Elections vs. Operations) that is charged for the equipment. Currently this determination is largely guess work, as no comprehensive system is in place at this time.

Personal Computer Reliability

A higher than normal failure rate has been symptomatic of the PC's installed in the mission. Typical problems are: windows registry errors, spontaneous rebooting, and system lock-ups. Whereas some degree of errors occur on most all PC's, a much higher rate of failure is being experienced with many of the 200+ 'no-name' PC's used in the OSCE mission.

File Servers

The File Servers originally planned called for three (3) SAG high-end computers. This order has been changed to COMPAQ file servers primarily due to SAG's lack of Microsoft NT certification. In addition, the quantity has been increased to four (4) due to the fact that there will be 2 networks, and each will require a File/Print Server, as well as a SQL Database Server.

Network Software

Microsoft has been generous enough to donate what appears to be all the systems software we will need for the mission. This includes Windows NT Server, SQL Server, Windows '95, Office Pro '95, as well as two (2) Microsoft Network Engineers to help with the network installation here in Sarajevo. Unfortunately, to date, the actual software has not arrived. What we have received is the license packs, which is simply the certification of authorization that we have lawful rights to the software. This is certainly just a misunderstanding, but more coordination with Microsoft is required. The contacts are:

Chris Ellis, US State Department, (202) 736-7291

Megan Brown, Microsoft Corp., (206) 936-9425

Serena Wassman, Microsoft Corp., (206) 703-2687

The actual scheduling of the two Microsoft Network Engineers needs to occur directly after all the Network Hardware (File Servers, cards, cabling) arrives, and is installed. *When* this is likely to happen is very difficult to determine because of the aforementioned problems. One last item on the Network concerns the physical connection of the Bank building with Administration Building. The best recommendation for this is to dig a trench about 1 foot deep across the driveway separating the 2 buildings, and run a cable through a small tube. There is presently a phone connection running under the drive to service the 2 buildings, but there reportedly is no room for an additional wire.

PC Operating System Software

Most of the computers in the Administration are running Windows 3.1, as well as MS Office 4.2. This is contrasted with the computers on the election side (Bank Building) which are running Windows '95, and Office '95. Whereas this is a technically feasible approach, it is not desirable. The support requirements can grow exponentially when a variety of platforms are employed. This is particularly problematic with MS Access when compared with Office 4.2 and Office '95. To support this environment, 2 different versions of the same database application program will need to be developed, installed, and supported to be able to cross platforms. Word processing documents can also be a problem depending on the extended character set used, and the different implementation of regional setting between Windows 3.1 and Windows '95.

Hardware and Software Installation

As mentioned in Michael Yard's report, installation of computer system can be a lengthy process. Hardware installation simply requires people to un-box and perform minimal connections. The biggest obstacle here has been the ability to hire and retain people for this job. My understanding is that as of Monday June 3rd, Dragisa has made good progress in this area. The Software installation process, however, is much too slow. Currently, as many as 24 diskettes need to methodically be fed into each computer, periodically answering question, but mostly just waiting for files to copy. This will be improved greatly when the Network becomes available by installing over the LAN at much greater speed.

Electronic Mail

Another requirement that is badly needed is an Electronic Mail system to be used internally, with an Internet connection for remote E-Mail addresses. When the Network is installed, a post-office should be setup to handle this very important task. The local E-Mail capability alone will provide a *tremendous* improvement in productivity, and coordination between various work groups.

Part 2 - Database Systems

Provisional Voters List (PVL)

A new copy of the PVL has been obtained from the statistical institute. The data is currently in a MS Access database, residing on a temporary Windows '95 (Peer to Peer) Network. From this list we have converted to the extended (Latin) character set, and created a normalized schema for interfacing to other systems (i.e. the candidate registration system). The census table contains just over 3.5 million people, of which about 1.04 million (30%) do not have ID Numbers.

Voter Registration

A big question surrounds the issue of what information will be updated on the '91 Census database, based on the forms that will be returned as a result of the voter registration process. It is largely assumed that a complete update is not possible within the current election time-table, of which I certainly agree. There is a need, however, to determine how many ballots to send to each Opstina's Local Election Commission (LEC). At this point I suspect we will at least need to enter 'ID Number' and 'New Opstina' for those who choose to change their municipality. This will be important to reduce the ballot count from one Opstina, and add to another. In the same way forms indicating a deceased person need to be captured as to reduce a ballot count.

Generally speaking, even if only a limited amount of the information returned on forms can be entered for election purposes, this same information will be of great value to both the Statistical Institute, as well as for subsequent BiH Elections. Therefore it is recommended that the data entry staff at the Institute consider the complete entry of forms when time permits.

Refugee Voter Registration and Balloting

A system is currently under development, and is expected to be completed by Sunday June 9th. The system consists of two forms. The first is for citizen lookup by 'ID Number', and the second is for a more general lookup. Mr. Keith Hall, a new arrival to replace Audrey, is presently completing this database. He will also work to distribute this program on the 20 laptops scheduled to arrive in Vienna for Refugee Host Country training on Monday June 10th.

Political Party And Candidate Registration

The preliminary design of the Candidate Registration system is complete and ready for beta-testing at the Statistical Institute. Mr. Amir Steta has done an excellent job as the primary developer on this system. Please refer to Appendix "B" for the current schema. This system needs to be installed at the Institute for testing of both the program, as well as data entry candidates. Additional features that may be added to this database include:

- Ballot Printing
- Polling location candidates list (for posters)

Database Systems to be Evaluated

Due to the extreme priority driven nature of my two weeks in Sarajevo, the systems below were not significantly examined. Keith Hall will be tasked with this evaluation upon my return to the states. It is my expectation that on or about June 11th, he will have some time to begin this work. The following systems fall under this category:

- Inventory Of Sensitive Documents
- Consumable Inventory
- Personnel
- Monitor Accreditation
- Supervisor Logistics
- Vote Result Calculation And Seat Allocation
- Statistical Evaluation Of Election

Staffing

I basically concur with Mike's assessment of staffing with the addition of staff for a Help Desk. A good ratio to consider for this purpose is one Support Technician for every 40 or 50 users. It should be noted that Staffing requirements are better determined after the 'Design and Analysis' phase of the required systems is completed. However, understanding that this may not be possible, my current recommendation for staffing the OSCE BiH Mission - Elections IT staff would be:

- Chief Technical Manager to remain throughout the project
- 1 Director of Systems Development to remain throughout the project
- 1 Windows NT Network Administrator to remain throughout the project
- 1 SQL Server Database Administrator for a period of 4 to 8 weeks
- 4 Microsoft Access Database Developers for a period of 4 to 8 weeks
- 1 Help Desk Technical Support Manager to remain throughout the project
- 4 Help Desk Support Technicians (two for 8 weeks, two for entire project)

I would further recommend that local's be considered for many of the development positions as Dragisa and Amir have proved to be very talented in MS Access database development.

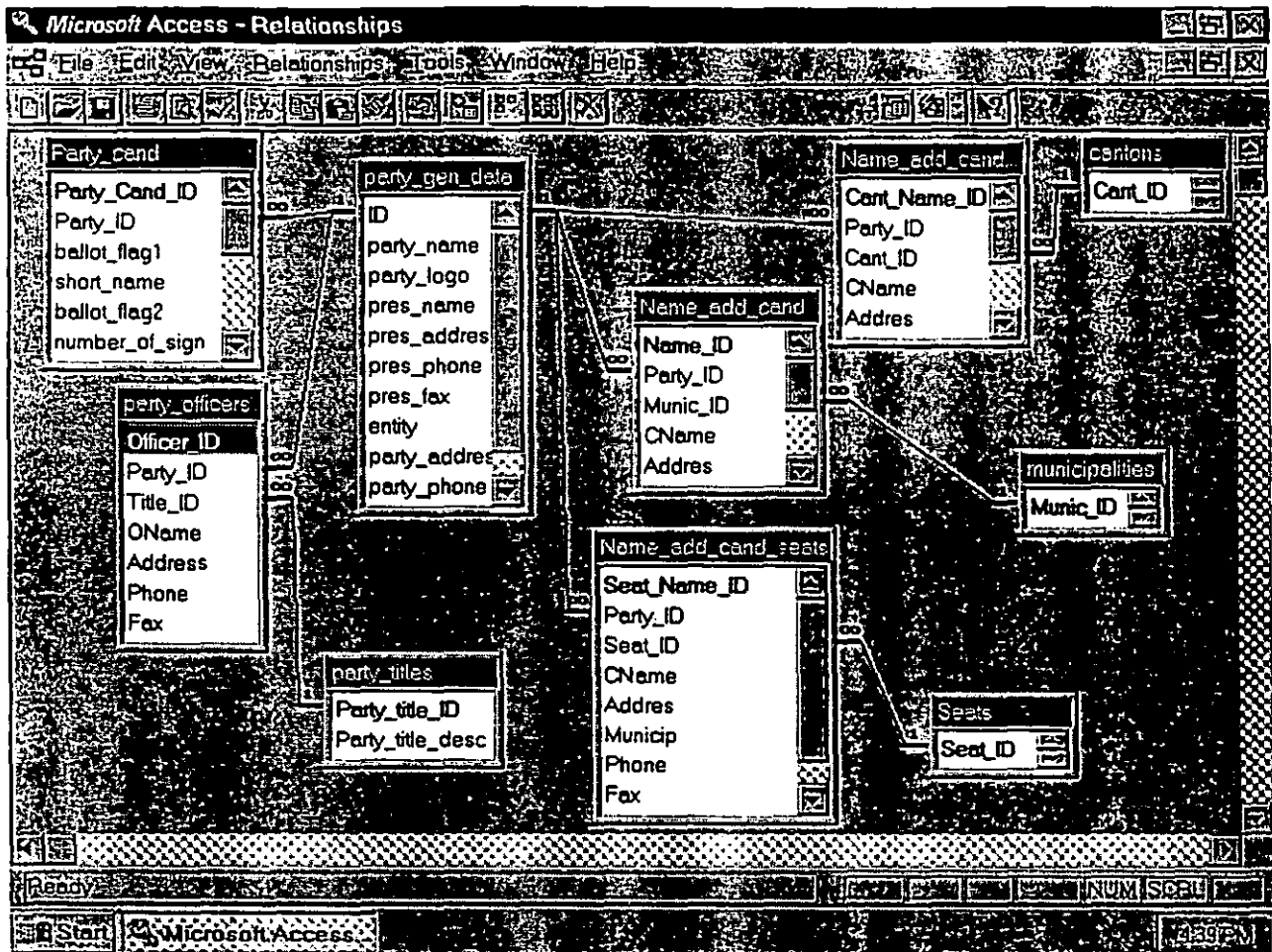
Role Of Statistical Institute

The institute should be considered a partner in this elections effort. It is possible that developers would be located at that site, along with the data entry personnel. Much of the work that has begun here will be continued by the Institute for subsequent elections. Detailed coordination is essential in this relationship and it is my recommendation that Dragisa Vukajlovic perform this important role. I believe that the Statistical Institute will be an considerable asset to the entire elections effort.

Appendix "A"

Section	Staff		Plan						Delivered						Difference					
	International	Local	PC desktop	desktop printer	notebook computer with printer	laser printer	UPS & stabilizer 1400VA & 1250VA	UPS 750 VA	PC desktop	desktop printer	notebook computer with printer	laser printer	UPS & stabilizer 1400VA & 1250VA	UPS 750 VA	PC desktop	desktop printer	notebook computer with printer	laser printer	UPS & stabilizer 1400VA & 1250VA	UPS 750 VA
Headquarters			4		2	1	2	1	4	3	2	2	3		0	-3	0	-1	-1	1
Pres Office			4		2		2	1	4	1	1		2		0	-1	1	0	0	1
Media Development			3		1		2		3	1	1		1		0	-1	0	0	1	0
Human Rights			5		3		3	1	7	2	4		2		-2	-2	-1	0	1	1
Operations			3				1		3	1			1		0	-1	0	0	0	0
Administration			3				2		2	1				1	1	-1	0	0	2	-1
IT			5		1		2	1	2		1		2		3	0	0	0	0	1
Finance			7		1		2		7	1	1	1	3		0	-1	0	-1	-1	0
Logistics			5	1	2		3	1	6	3	2		4		-1	-2	0	0	-1	1
Regional Stabilization			12	1	5	1	7	1	10	2	6		5		2	-1	-1	1	2	1
Election Component (old)			6		2		3	1	15	6	5		6		-9	-6	-3	0	-3	1
Network (HQ) & e-mail			2			3	6		1			4	1		1	0	0	-1	5	0
Secretariat			5	1			2		4	2			2		1	-1	0	0	0	0
TOTAL HQS SARAJEVO			64	3	19	5	37	7	68	23	23	7	32		-4	-20	-4	-2	5	7
ECMM			1	1	3		2		1		2		1		0	1	1	0	1	0
IFOR Liaison Officer			1				1		1	1			1		0	-1	0	0	0	0
TUZLA RC & 4 MDO			10	8	13	1	3	10	9	6	9	1	4	8	1	2	4	0	-1	2
BANJA LUKA RC & 5 MDO			11	9	15	1	3	12	10	5	10	1	4	9	1	4	5	0	-1	3
BIHAĆ RC & 5 MDO			11	9	15	1	3	12	7	4	11	1	4	10	4	5	4	0	-1	2
MOSTAR RC & 6 MDO			12	10	17	1	3	14	7	6	11	1	4	4	5	4	6	0	-1	10
SOKOLAC RC & 5 MDO			11	9	15	1	3	12	6	2	9		4		5	7	6	1	-1	12
SARAJEVO RC & 1 MDO			4	3	5		2	3	4	2	3		2		0	1	2	0	0	3
BACK-UP/SPARE				3	5	2	3	4	1		3		1	1	-1	3	2	2	2	3
STORAGE ROOM (old budget)									10	5	26	3	3	16	-10	-5	-26	-3	-3	-16
TOTAL (PREVIOUS PLAN)			125	55	107	12	60	74	124	54	107	14	60	48	1	1	0	-2	0	26
ELECTIONS (elections budget)			93		30	11	32		10		1	2	1		83	0	29	9	31	0
STORAGE ROOM (elections budget)									81		27	9	31		-81	0	-27	-9	-31	0
TOTAL (elections budget)			93	0	30	11	32	0	91	0	28	11	32	0	2	0	2	0	0	0
SUPERVISOR GROUP			4	3	2		2		2	1	2		1		2	2	0	0	1	0
TOTAL OSCE MISSION			228	58	139	23	94	74	217	55	137	25	94	48	3	3	-2	1	1	26

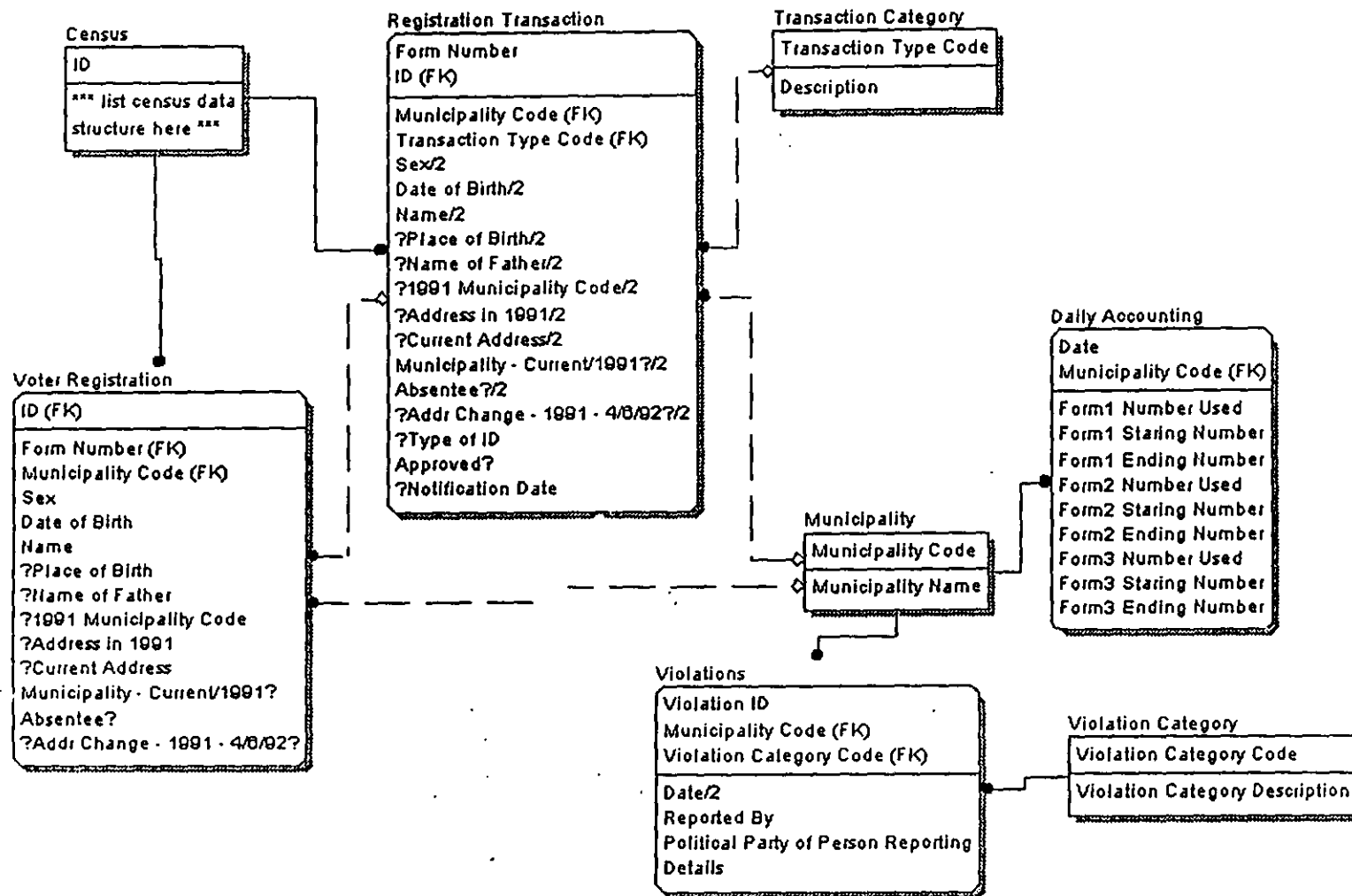
Appendix "B"



Appendix "C"

Data Dictionary
Needs

Voter Registration Database - Entity Relationship Diagram



APPENDIX C

**ELECTIONS: BOSNIA AND HERZEGOVINA
THE OSCE'S BOSNIAN ELECTION WEBSITE
THE IFES-DEVELOPED HOMEPAGE**

DESIGNED BY:

**HANK VALENTINO
ADELE VALENTINO
SCOTT LANSELL**

OSCE Bosnia & Herzegovina Official Election Website

[Bosnian](#) || [Croatian](#) || [Serbian](#)

MI
GRADIMO
BOLJU
BUDUCNOST
ZAJEDNO



OSCE MISSION TO BOSNIA
AND HERZEGOVINA

ELECTIONS RESULTS

REFUGEE VOTING	AGREEMENTS
PRESS RELEASES	MAPS
FACT STATEMENTS	VOTER EDUCATION
RULES & REGULATIONS	POLITICAL PARTIES
CANDIDATES	OTHER VOTER EDUCATION

If audio capable download [Greeting from Ambassador Frowick \(413K au\)](#)

This site is provided by the OSCE Mission to Bosnia and Herzegovina to provide information about the OSCE's activities, particularly as they relate to the elections scheduled for September 14, and to assist refugees to vote in those elections.

MUNICIPAL ELECTIONS POSTPONED (Statement by Ambassador Frowick on Postponement - 27 August 1996)

Download these TrueType [FONTS](#) to view the non-English sections of this web site, and set your browser to Central European (Bosnian or Croatian) or Cyrillic Document Encoding.

Service Provided by [EU Net](#)

IFES
International Foundation
For Election Systems

OSCE
Organization for Security
and Co-operation in Europe

ODIHR
Office for Democratic
Institutions and Human
Rights

[OSCE WWW Site Information](#)

APPENDIX D

**ELECTIONS: BOSNIA AND HERZEGOVINA
DRAFT
PEC VOTER REGISTRATION "FORMS"**

Application form number 1

Serial number xxxxxxxxxx

PEC - PROVISIONAL ELECTION COMMISSION**APPLICATION**

- ☐ → TO HAVE NAME ADDED TO THE PROVISIONAL VOTERS LIST.
- ☐ → TO HAVE NAME CHANGED IN THE PROVISIONAL VOTERS LIST.
- ☐ → TO VOTE BY ABSENTEE BALLOT IN THE MUNICIPALITY IN WHICH REGISTERED IN 1991.
- ☐ → TO HAVE NAME DELETED FROM THE PROVISIONAL VOTERS LIST.
- ☐ → TO VOTE FROM ADDRESS AT WHICH RESIDENT BETWEEN CENSUS 1991 AND APRIL 6, 1992
IN PERSON OR BY ABSENTEE BALLOT.

1	Identify Number	3	Male (x)	Female (x)	4	Date of Birth
2	Name					
5	Place of birth	Name of Father				
6	Municipality in which registered in 1991	Current Municipality				
7	Address in 1991	Current address				
8 Change of address between 1991 Census and April 6, 1992 Yes <input type="checkbox"/> No <input type="checkbox"/>						
Municipality		Address				
9 Absentee ballot requested Yes <input type="checkbox"/> No <input type="checkbox"/>						
Date		Signature of Applicant				

Documents produced (if required)		<input type="checkbox"/> Birth certificate
<input type="checkbox"/> ID-card		<input type="checkbox"/> Marriage certificate
<input type="checkbox"/> Passport		<input type="checkbox"/> Citizenship certificate
<input type="checkbox"/> Driving license		<input type="checkbox"/> Health booklet
<input type="checkbox"/> Military booklet		<input type="checkbox"/> Resident certification
<input type="checkbox"/> Other:		<input type="checkbox"/> Other:

Approved or disapproved (Mark of Deciding Authority).		If disapproved, voter notified of appeal procedure
Approved <input type="checkbox"/>	Disapproved <input type="checkbox"/>	
		Date

Copy one to Provisional Election Commission

Application form number II

Serial number xxxxxxxx

PEC - PROVISIONAL ELECTION COMMISSION**APPLICATION:**

TO HAVE THE RIGHT TO VOTE IN A DIFFERENT MUNICIPALITY FROM THAT IN WHICH REGISTERED IN 1991.

AN ABSENTEE BALLOT IS NOT PERMITTED IN THESE CIRCUMSTANCES.

1	Identity Number	3	Male (x)	Female (x)	4	Date of Birth
2	Name					
5	Place of birth	Name of father				
6	Municipality in which registered in 1991	Current Municipality				
7	Address in 1991	8. Current Address				
Application to vote in:						
9	<input type="checkbox"/> Current address. Intend to continue to live there.					
10	<input type="checkbox"/> Municipality in which intend to live in the future. Name of municipality					
Reason for request:						
Future address in this municipality (if known)			Citizenship in this municipality			
Family members in this municipality			Other reasons			
Date		Signature of Applicant				

Documents produced	<input type="checkbox"/> Birth certificate
<input type="checkbox"/> ID-card	<input type="checkbox"/> Marriage certificate
<input type="checkbox"/> Passport	<input type="checkbox"/> Citizenship certificate
<input type="checkbox"/> Driving license	<input type="checkbox"/> Health booklet
<input type="checkbox"/> Military booklet	<input type="checkbox"/> Resident certification
<input type="checkbox"/> Other:	<input type="checkbox"/> Other:
Approved or disapproved: (Mark of Deciding Authority).	
Approved <input type="checkbox"/>	If disapproved, voter notified of appeal procedure.
Disapproved <input type="checkbox"/>	
Date	

Copy one to Provisional Election Commission.

Copy two to Local Election Commission.

Copy three to Voter.

Serial number: xxxxxxx

FROM THE DECISION OF THE LOCAL ELECTION COMMISSION DENYING THE APPLICATION FOR CHANGES TO THE PROVISIONAL VOTERS' LIST.

Place, date and signature (Mark of Authorship).

Approved or disapproved by the Provisional Election Commission

Copy one to Provisional Election Commission.

APPENDIX E

**ELECTIONS: BOSNIA AND HERZEGOVINA
BOSNIAN ELECTORAL REGISTRATION ABROAD
AS OF 30 JULY 1996**

Update on Bosnian Electoral Registration Abroad			
Information as of 30 July, 1996			
Coordination Office	Total Registered (1)	Previous Total : 29/7	Increase
Albania	0	0	0
Austria	6700	6000	700
Belgium	759	769	0
Canada	2285	1443	822
Croatia	0	0	0
Denmark	3382	1800	1582
Federal Republic of Yugoslavia	14388	11765	2603
FY Republic of Macedonia	842	942	0
Finland	0	0	0
France	477	155	322
Germany	29248	19440	8808
Hungary	810	685	125
Ireland	236	236	0
Italy	0	0	0
Luxembourg	7	7	0
Netherlands	2647	1388	1261
Norway	2785	2785	0
Slovak Republic	0	0	0
Slovenia	3378	3378	0
Sweden	2073	2073	0
Switzerland	10831	7256	3575
Turkey	955	955	0
United Kingdom	605	605	0
United States	781	604	157
RESG Office (2) :	820	40	780
Australia	^		
Bulgaria	^		
Czech Republic	^		
Jordan	^		
Liechtenstein	^		
Pakistan	^		
Spain	^		
United Arab Emirates	^		
TOTALS	84029	62314	21715
Notes: (1) Registered means verified eligible to vote in the Bosnian elections.			
(2) All applications from other countries are verified through the RESG Office in Vienna.			
(3) Over 600,000 contacts made.			

APPENDIX F

ELECTIONS: BOSNIA AND HERZEGOVINA THE OSCE'S BOSNIAN ELECTION WEBSITE ELECTORAL RESULTS SECTION

DESIGNED BY:

**ROGER PLATH
HANK VALENTINO
ADELE VALENTINO
SCOTT LANSELL**

IZBORI 1996 ELECTIONS

BOSNA i HERCEGOVINA

These elections results are direct from the official OSCE results tabulation center and will be updated as new information is received. The election results are NOT OFFICIAL until certified by the BiH Provisional Election Commission (PEC).

Ovi izborni rezultati pristi`u direktno iz OSCE-ovog centra za tabelarno prikazivanje slu`benih rezultata i bi`e a`urirani kako budu pristizale nove informacije. Izborni rezultati NISU ZVANI^NI dok ih ne potvrdi Privremena izborna komisija(PIK) BiH.

Rezultati ovih izbora pristi`u izravno iz OSS-ovog centra za tabelarno prikazivanje slu`benih rezultata i bit `e a`urirani kako budu pristizale nove informacije. Izborni rezultati NISU SLU@BENI dok ih ne potvrdi Privremeno izorno povjerenstvo BiH.

To properly view the Bosnian and Croatian words, set your browser's font to Times New Roman BH. If you do not have this font, it can be downloaded from the [Home Page](#) of this site.

Parties and candidates running in or for the Republika Srpska may be viewed in Serbian by changing your browser font to Times-C (cyrillic) and then [clicking here](#). If you do not have this font, it can be downloaded from the [Home Page](#) of this site.

Parties and candidates are listed in the order that they appear on the ballots. This order was determined by lottery.

CURRENT NATIONAL ELECTIONS RESULTS

18 September 1996 14:13 (GMT +1)

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[Presidency of BiH - Croatian](#)

[Presidency of BiH - from Republika Srpska](#)

[House of Representatives of BiH - Federation](#)

[House of Representatives of BiH - Republika Srpska](#)

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[National Assembly of the Republika Srpska](#)

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[Predsjedni{tvo BiH - Bo{njak](#)

[Predsjedni{tvo BiH - Hrvat](#)

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[Predstavni~ki dom Republike Srpske BiH](#)

[Predsjedni{tvo Republike Srpske](#)

[Narodna Skup{tina Republike Srpske](#)

[Zastupni~ki dom Federacije](#)

Presidency of BiH - Bosnian

125 of 151 Municipal Counting Centers Reporting

Predsjedništvo BiH - Bošnjak

STRANKA PARTY	PARTY STRANKA	KANDIDAT CANDIDATE	GLASOVI VOTES	%
GRAVANSKA DEMOKRATSKA STRANKA BIH	CITIZEN DEMOCRATIC PARTY OF BIH	IBRAHIM SPAHIJ	3,805	
STRANKA PRIVREDNOG PROSPERITETA BOSNE I HERCEGOVINE	PARTY OF ECONOMIC PROSPERITY OF BOSNIA AND HERZEGOVINA	SAFET RED@EPAGIJ	1,337	
ZDRU@ENA LISTA BIH (UBSD, SDP BIH, HSS, MBO, REPUBLIKANCI)	UNITED LIST OF BIH (UBSD, SDP BIH, HSS, MBO, REPUBLIKANCI)	SEAD AVDIJ	20,332	2%
SDA	PARTY OF DEMOCRATIC ACTION	ALIJA IZETBEGOVIJ	664,690	81%
LIBERALI BIH	LIBERAL PARTY OF BIH	HASIB SALKIJ	3,657	
BOSANSKA STRANKA	BOSNIA PARTY	MIRNES AJANOVIJ	2,208	
DEMOKRATSKA NARODNA ZAJEDNICA	DEMOCRATIC PEOPLE'S UNION	FIKRET ABDIJ	11,328	1%
STRANKA ZA BOSNU I HERCEGOVINU	PARTY FOR BIH	HARIS SILAJD@IJ	118,305	14%

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Presidency of BiH - Croatian

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Predsjedništvo BiH - Hrvat

STRANKA PARTY	PARTY STRANKA	KANDIDAT CANDIDATE	GLASOVI VOTES	%
GRAVANSKA DEMOKRATSKA STRANKA BIH	CITIZEN DEMOCRATIC PARTY OF BIH	ANTON [TITI]	1,954	1%
ZDRU@ENA LISTA BiH (HSS, SDP BiH, UBSD, MBO, REPUBLIKANCI)	UNITED LIST OF BIH (HSS, SDP BIH, UBSD, MBO, REPUBLIKANCI)	IVO KOM[I]	35,662	12%
LIBERALI BIH	LIBERAL PARTY OF BIH	VINKO JURO	1,993	1%
HRVATSKA DEMOKRATSKA ZAJEDNICA	CROAT DEMOCRATIC PARTY OF BIH	KRE[IMIR ZUBAK	266,487	87%

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Presidency of BiH - from Republika Srpska

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Predsjedništvo BiH - iz Republike Srpske

STRANKA PARTY	PARTY STRANKA	KANDIDAT CANDIDATE	GLASOVI VOTES	%
SRPSKA DEMOKRATSKA STRANKA /SRPSKIH ZEMAQA/	SERB DEMOCRATIC PARTY	MOM^ILO KRAJI[NIK	592,851	67%
DEMOKRATSKI PATRIOTSKI BLOK RS - NARODNI SAVEZ ZA SLOBODAN MIR	DEMOCRATIC PATRIOTIC BLOCK OF RS - PEOPLE'S UNION FOR PEACE	MLADEN IVANI]	267,003	30%
SRPSKA PATRIOTSKA STRANKA - SPAS	SERB PATRIOTIC PARTY - SPAS	MILIVOJE ZARI]	13,492	2%
SRPSKA STRANKA KRAJINE	SERB PARTY OF KRAJINA	BRANKO LATINOVI]	10,394	1%

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House of Representatives of BiH - Federation

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Zastupni~ki dom Federacije BiH

STRANKA PARTY	PARTY STRANKA	GLASOVI VOTES	%
GRAVANSKA DEMOKRATSKA STRANKA BiH	CITIZEN DEMOCRATIC PARTY OF BIH	2,638	
STRANKA PRIVREDNOG PROSPERITETA BOSNE I HERCEGOVINE	PARTY OF ECONOMIC PROSPERITY OF BOSNIA AND HERZEGOVINA	3,869	
ZDRU@ENA LISTA BiH (SDP BiH, UBSD, HSS, MBO, REPUBLIKANCI)	UNITED LIST OF BIH (SDP BiH, UBSD, HSS, MBO, REPUBLIKANCI)	91,308	9%
SDA	PARTY OF DEMOCRATIC ACTION	563,900	57%
HRVATSKA STRANKA PRAVA	CROATIAN RIGHTS PARTY	9,365	1%
LIBERALI BiH	LIBERAL PARTY OF BIH	3,787	
BOSANSKA STRANKA	BOSNIA PARTY	5,211	1%
HRVATSKA DEMOKRATSKA ZAJEDNICA	CROAT DEMOCRATIC PARTY OF BIH	210,872	21%
BOSANSKO HERCEGOVA^KA PATRIOTSKA STRANKA	BOSNIA-HERZEGOVINA PATRIOTIC PARTY	2,482	
DEMOKRATSKA NARODNA ZAJEDNICA	DEMOCRATIC PEOPLE'S UNION	9,197	1%
LIBERALNO BO[NJA^KA ORGANIZACIJA BiH	LIBERAL BOSNIAK ORGANIZATION OF BIH	1,533	
STRANKA ZA BOSNU I HERCEGOVINU	PARTY FOR BIH	74,652	8%
SREBROV VLADIMIR	SREBROV VLADIMIR	3,667	
@ENA BiH	WOMEN OF BIH	3,245	

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House of Representatives of BiH - Republika Srpska

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Predstavni~ki dom Republike Srpske BiH

STRANKA PARTY	PARTY STRANKA	GLASOVI VOTES	%
GRA\ANSKA DEMOKRATSKA STRANKA BiH	Citizen Democratic Party of BiH	1,807	
ZDRU@ENA LISTA BiH (SDP BiH, UBSD, HSS, MBO, REPUBLIKANCI)	United List of BiH (SDP BiH, UBSD, HSS, MBO, REPUBLIKANCI)	15,643	3%
NARODNA STRANKA REPUBLIKE SRPSKE	People's Party of Republika Srpska	6,020	1%
SDA	Party of Democratic Action	117,569	24%
SRPSKA DEMOKRATSKA STRANKA /SRPSKIH ZEMAQA/	Serb Democratic Party	256,870	51%
SRPSKA RADIKALNA STRANKA REPUBLIKE SRPSKE	Serb Radical Party of Republika Srpska	26,635	5%
DEMOKRATSKI PATRIOTSKI BLOK REPUBLIKE SRPSKE	Democratic Patriotic Block of Republika Srpska	8,658	2%
NARODNI SAVEZ ZA SLOBODAN MIR (SAVEZ ZA MIR I PROGRES)	People's Union for Peace (Union for Peace and Progress)	57,510	11%
SRPSKA PATRIOTSKA STRANKA - SPAS	Serb Patriotic Party - SPAS	5,989	1%
STRANKA SRPSKOG JEDINSTVA	Party of Serb Unity	3,388	1%
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Presidency of the Republika Srpska

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Predsjedništvo Republike Srpske

STRANKA PARTY	PARTY STRANKA	KANDIDAT CANDIDATE	GLASOVI VOTES	%
SDA	PARTY OF DEMOCRATIC ACTION	ADIB \OZI], MEVLUDIN SEJMENOV]]	31,703	7%
SRPSKA DEMOKRATSKA STRANKA /SRPSKIH ZEMAQA/	SERB DEMOCRATIC PARTY	BIQANA PLAV[I], DRAGOQUB MIRJANI]	319,960	70%
DEMOKRATSKI PATRIOTSKI BLOK REPUBLIKE SRPSKE	DEMOCRATIC PATRIOTIC BLOCK OF REPUBLIKA SRPSKA	PREDRAG RADI], DRAGOMIR GRUBA^	12,705	3%
NARODNI SAVEZ ZA SLOBODAN MIR (SAVEZ ZA MIR I PROGRES)	PEOPLE'S UNION FOR PEACE (UNION FOR PEACE AND PROGRESS)	@IVKO RADI[I], NE\O \URI]	77,154	17%
SRPSKA PATRIOTSKA STRANKA - SPAS	SERB PATRIOTIC PARTY - SPAS	SLAVKO LISICA, KOJO GARI]	8,597	2%
DEMOKRATSKA STRANKA FEDERALISTA	DEMOCRATIC PARTY OF FEDERALISTS	DRAGAN \OKANOVI], \URA\ DAVIDOVI]	1,083	
STRANKA SRPSKOG JEDINSTVA	PARTY OF SERB UNITY	LJILJA PERI], MIŁORAD MILAKOVI]	2,732	1%

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National Assembly of the Republika Srpska

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Narodna Skupština Republike Srpske

STRANKA PARTY	PARTY STRANKA	GLASOVI VOTES	%
SDPBiH - UBSD - MBO - HSS	SDPBIH - UBSD - MBO - HSS	4,056	1%
RADIKALNI OTAD@BINSKI FRONT "NIKOLA PA[I]"	RADICAL HOMELAND FRONT "NIKOLA PA{I}"	1,171	
SRPSKA SEQA^KA STRANKA REPUBLIKE SRPSKE	SERB PEASANT PARTY OF REPUBLIKA SRPSKA	1,335	
GRAVANSKA DEMOKRATSKA STRANKA BIH	CITIZEN DEMOCRATIC PARTY OF BIH	1,573	
NARODNA STRANKA REPUBLIKE SRPSKE	PEOPLE'S PARTY OF REPUBLIKA SRPSKA	1,947	
SDA	PARTY OF DEMOCRATIC ACTION	24,733	6%
SRPSKA DEMOKRATSKA STRANKA /SRPSKIH ZEMAQA/	SERB DEMOCRATIC PARTY	252,242	62%
SRPSKA RADIKALNA STRANKA REPUBLIKE SRPSKE	SERB RADICAL PARTY OF REPUBLIKA SRPSKA	31,944	8%
DEMOKRATSKI PATRIOTSKI BLOK REPUBLIKE SRPSKE	DEMOCRATIC PATRIOTIC BLOCK OF REPUBLIKA SRPSKA	9,374	2%
NARODNI SAVEZ ZA SLOBODAN MIR (SAVEZ ZA MIR I PROGRES)	PEOPLE'S UNION FOR PEACE (UNION FOR PEACE AND PROGRESS)	54,297	13%
SRPSKA PATRIOTSKA STRANKA - SPAS	SERB PATRIOTIC PARTY - SPAS	5,529	1%
DEMOKRATSKA STRANKA FEDERALISTA	DEMOCRATIC PARTY OF FEDERALISTS	2,087	1%
STRANKA ZA BOSNU I HERCEGOVINU	PARTY FOR BIH	4,688	1%
SRPSKA STRANKA KRAJINE @ENA BiH	SERB PARTY OF KRAJINA WOMEN OF BIH	6,319 516	2%
STRANKA SRPSKOG JEDINSTVA	PARTY OF SERB UNITY	2,655	1%
	<u>Return to List</u>		

House of Representatives of the Federation

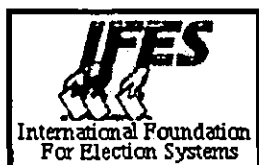
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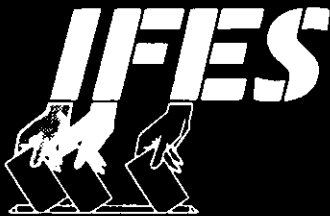
Zastupni~ki dom Federacije

STRANKA PARTY	PARTY STRANKA	GLASOVI VOTES	%
ZDRU@ENA LISTA BiH (UBSD, SDP BiH, REPUBLIKANCI, HSS, MBO)	UNITED LIST OF BiH (UBSD, SDP BiH, REPUBLIKANCI, HSS, MBO)	59,034	7%
GRAVANSKA DEMOKRATSKA STRANKA BiH	CITIZEN DEMOCRATIC PARTY OF BiH	2,545	
STRANKA PRIVREDNOG PROSPERITETA BOSNE I HERCEGOVINE	PARTY OF ECONOMIC PROSPERITY OF BOSNIA AND HERZEGOVINA	1,745	
ZDRU@ENA LISTA BiH (SDP BiH, UBSD, HSS, MBO, REPUBLIKANCI)	UNITED LIST OF BiH (SDP BiH, UBSD, HSS, MBO, REPUBLIKANCI)	183	
SDA	PARTY OF DEMOCRATIC ACTION	509,933	59%
HRVATSKA STRANKA PRAVA LIBERALI BiH	CROATIAN RIGHTS PARTY	8,942	1%
BOSANSKA STRANKA	LIBERAL PARTY OF BiH	2,905	
HRVATSKA DEMOKRATSKA ZAJEDNICA	BOSNIA PARTY	4,068	
BOSANSKO HERCEGOVA^KA PATRIOTSKA STRANKA	CROAT DEMOCRATIC PARTY OF BiH	188,830	22%
DEMOKRATSKA NARODNA ZAJEDNICA	BOSNIA-HERZEGOVINA PATRIOTIC PARTY	2,179	
LIBERALNO BO[NJA^KA ORGANIZACIJA BiH	DEMOCRATIC PEOPLE'S UNION	7,750	1%
STRANKA ZA BOSNU I HERCEGOVINU	LIBERAL BOSNIAK ORGANIZATION OF BiH	1,564	
@ENA BiH	PARTY FOR BiH	65,118	8%
	WOMEN OF BiH	2,716	

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