Comparative Risk Analysis of the Current UOCAVA Voting System and an Electronic Alternative Report Security Risk Estimates

SECURITY RISK ASSIGNMENT MATRIX - CURRENT UOCAVA VOTING SYSTEM

VOTING STEP	l		THREAT VECTORS		RISK ESTIMATES		SECUR	ITY RISK O	BJECTIVES		
					Current UOCAVA	Voter	Vote Secrecy	Vote	Vote	Auditability	Service
	Level 1	Level 2	Level 3	Threat ID	Voting System	Authentication	vote secrety	Integrity	Privacy	Additability	Availability
Registration	Attacks	Insider Attacks	Attacks Against VRDB	REG-INS-VRDB	1.061	Х		Х		Х	Х
Registration	Attacks	Insider Attacks	Attacks to Voter's Assistance	REG-INS-ASST	0.859			Х			
Registration	Attacks	Insider Attacks	Attacks to Voting Access	REG-INS-ACCS	1.045			Х			Х
Registration	Attacks	Insider Attacks	Attacks by Denial of Service	REG-INS-DOSV	0.814						Х
Registration	Attacks	Insider Attacks	Attacks Against Registration Forms and Instructions	REG-INS-REGF	0.839			Х		Х	Х
Registration	Attacks	Insider Attacks	Attacks During Transmission of Registration Forms and Instructions	REG-INS-TREG	0.838			Х		Х	Х
Registration	Attacks	Insider Attacks	Attacks During Transmission of Completed Registration Packets	REG-INS-TCRP	1.042	X	X	Х		X	
Registration	Attacks	Insider Attacks	Attacks Against Processing of Completed Registration Packets	REG-INS-PCRP	1.108	Х	X	Х		Х	
Registration	Attacks	Insider Attacks	Attacks During Transmission of Registration Rejections	REG-INS-TRRP	0.826		X				
Registration	Attacks	Outsider Attacks	Attacks Against Voter's Assistance	REG-OUT-ASST	1.039			Х			4
Registration	Attacks	Outsider Attacks	Attacks Against Marking of Registration Forms	REG-OUT-MREG	1.471	Х	X	Х		Х	
Registration	Unintentional Disruptions	Error at the LEO	Errors in VRDB	REG-ERL-VRDB	1.131	Х		Х		Х	Х
Registration	Unintentional Disruptions	Error at the LEO	Errors in Voter's Assistance	REG-ERL-ASST	2.228			X			
Registration	Unintentional Disruptions	Error at the LEO	Errors in Registration Forms and Instructions	REG-ERL-REGF	1.125			X		X	X
Registration	Unintentional Disruptions	Error at the LEO	Errors in Processing Completed Registration Packets	REG-ERL-PCRP	1.176	X	X	X		X	
Registration	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Registration Forms and Instructions	REG-ERT-TREG	1.389		,-	X		X	Х
Registration	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Completed Registration Packets	REG-ERT-TCRP	1.171	Х	X	Х		Х	
Registration	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Registration Rejections	REG-ERT-TRRP	1.036		X				
Registration	Unintentional Disruptions	Error at the Voter's Location	Errors in Voting Access	REG-ERV-ACCS	2.985						Х
Registration	Unintentional Disruptions	Error at the Voter's Location	Errors in Obtaining Voter's Assistance	REG-ERV-ASST	2.035			X			
Registration	Unintentional Disruptions	Error at the Voter's Location	Errors in Registration Application	REG-ERV-REGF	2.959			Х		X	
Registration	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	REG-DIS-NATL	1.360					X	X
Registration	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	REG-DIS-NVRO	0.797					Х	Х
Registration	Unintentional Disruptions	Accidental Disruptions	Disruptions by Human-Created Collateral Events	REG-DIS-HUMN	0.797					Х	Х
Absentee Ballot Request	Attacks	Insider Attacks	Attacks Against VRDB	ABR-INS-VRDB	1.128	X		Х		Х	Х
Absentee Ballot Request	Attacks	Insider Attacks	Attacks to Voter's Assistance	ABR-INS-ASST	0.875			Х			
Absentee Ballot Request	Attacks	Insider Attacks	Attacks to Voting Access	ABR-INS-ACCS	0.914			Х			Х
Absentee Ballot Request	Attacks	Insider Attacks	Attacks by Denial of Service	ABR-INS-DOSV	0.796						Х
Absentee Ballot Request	Attacks	Insider Attacks	Attacks Against Absentee Ballot Request Forms and Instructions	ABR-INS-ABRF	0.859			X			X
Absentee Ballot Request	Attacks	Insider Attacks	Attacks During Transmission of Absentee Ballot Request Forms and Instructions	ABR-INS-TABR	0.769			X		X	Х
Absentee Ballot Request	Attacks	Insider Attacks	Attacks During Transmission of Completed Absentee Ballot Request Packets	ABR-INS-TCAP	0.954	X	X	X		X	
Absentee Ballot Request	Attacks	Insider Attacks	Attacks Against Processing of Completed Absentee Ballot Request Packets	ABR-INS-PCAP	1.001	Х	X	Х		Х	
Absentee Ballot Request	Attacks	Insider Attacks	Attacks During Transmission of Rejections of Absentee Ballot Requests	ABR-INS-TRAP	0.843		X	.,			
Absentee Ballot Request	Attacks	Insider Attacks	Attacks Against Absentee Ballots and Instructions	ABR-INS-ABSF	0.826			X		Х	Х
Absentee Ballot Request	Attacks	Outsider Attacks	Attacks Against Voter's Assistance	ABR-OUT-ASST	1.192			Х			
Absentee Ballot Request	Attacks	Outsider Attacks	Attacks by Denial of Service	ABR-OUT-DOSV	0.901			.,		.,	Х
Absentee Ballot Request	Attacks	Outsider Attacks	Attacks Against Marking of Absentee Ballot Requests	ABR-OUT-MABR	1.344	X	Х	X		X	
Absentee Ballot Request	Unintentional Disruptions	Error at the LEO	Errors in VRDB	ABR-ERL-VRDB	1.098	Х		X		Х	Х
Absentee Ballot Request	Unintentional Disruptions	Error at the LEO	Errors in Voter's Assistance	ABR-ERL-ASST	1.884			X		X	V
Absentee Ballot Request Absentee Ballot Request	Unintentional Disruptions Unintentional Disruptions	Error at the LEO Error at the LEO	Errors in Absentee Ballot Request Forms and Instructions Errors in Processing Completed Absentee Ballot Request Packets	ABR-ERL-ABRF ABR-ERL-PCAP	1.149 1.047	X	X	X		X	Х
Absentee Ballot Request	Unintentional Disruptions	Error at the LEO	Errors in Absentee Ballots and Instructions	ABR-ERL-PCAP	1.365	X	X	X		X	X
			Errors in Transmission of Absentee Ballot Request Forms and Instructions	ABR-ERL-ABSF ABR-ERT-TABR	1.365			X		X	
Absentee Ballot Request Absentee Ballot Request	Unintentional Disruptions Unintentional Disruptions	Error in Transmission Error in Transmission	Errors in Transmission of Absentee Ballot Request Forms and Instructions Errors in Transmission of Completed Absentee Ballot Request Packets	ABR-ERT-TCAP	1.092	x	×	X		X	Х
		Error in Transmission	·		1.092	X	X	Α		Α	
Absentee Ballot Request	Unintentional Disruptions		Errors in Transmission of Rejections of Absentee Ballot Requests	ABR-ERT-TRAP ABR-ERV-ACCS	2.905		X				
Absentee Ballot Request Absentee Ballot Request	Unintentional Disruptions Unintentional Disruptions	Error at the Voter's Location Error at the Voter's Location	Errors in Voting Access Errors in Obtaining Voter's Assistance	ABR-ERV-ACCS ABR-ERV-ASST	2.905			Х			Х
			ů .		2.689					V	4
Absentee Ballot Request Absentee Ballot Request	Unintentional Disruptions Unintentional Disruptions	Error at the Voter's Location Accidental Disruptions	Errors in Absentee Ballot Requests Disruptions by Natural Events	ABR-ERV-ABRF ABR-DIS-NATL	1.039			Х		X	X
Absentee Ballot Request	Unintentional Disruptions	Accidental Disruptions Accidental Disruptions	Disruptions by Natural Events Disruptions by Environmental Events	ABR-DIS-NVRO	0.732					X	X
Absentee Ballot Request	Unintentional Disruptions	Accidental Disruptions Accidental Disruptions	Disruptions by Human-Created Collateral Events	ABR-DIS-NVRO	1.113					X	X
		· · · · · · · · · · · · · · · · · · ·	Attacks by Denial of Service	ABD-INS-DOSV	0.924					^	X
Absentee Ballot Delivery Absentee Ballot Delivery	Attacks Attacks	Insider Attacks Insider Attacks	Attacks by Denial of Service Attacks During Transmission of Absentee Ballot and Instructions	ABD-INS-TABS	0.924			V		X	X
Absentee Ballot Delivery	Attacks	Outsider Attacks	Attacks by Denial of Service	ABD-OUT-DOSV	0.834			Х		^	X
Absentee Ballot Delivery	Unintentional Disruptions	Frror in Transmission	Errors in Transmission of Absentee Ballot and Instructions	ABD-ERT-TABS	1.700			Х		Х	X
										^	
Absentee Ballot Delivery	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	ABD-DIS-NATL	0.570						X
Absentee Ballot Delivery	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	ABD-DIS-NVRO	0.607						
Absentee Ballot Delivery	Unintentional Disruptions	Accidental Disruptions	Disruptions by Human-Created Collateral Events	ABD-DIS-HUMN	0.568	V	V	V	V	V	Х
Ballot Marking	Attacks	Outsider Attacks	Attacks Against Marking Absentee Ballots and Forms	BMK-OUT-MABS	1.271	Х	Х	Х	Х	Х	, , , , , , , , , , , , , , , , , , ,
Ballot Marking	Unintentional Disruptions	Error at the Voter's Location	Errors in Voting Access	BMK-ERV-ACCS	2.507						4 X

Comparative Risk Analysis of the Current UOCAVA Voting System and an Electronic Alternative Report Security Risk Estimates

SECURITY RISK ASSIGNMENT MATRIX - CURRENT UOCAVA VOTING SYSTEM

VOTING STEP			THREAT VECTORS		RISK ESTIMATES		SECUR	ITY RISK OF	BJECTIVES		
	Level 1	Level 2	Level 3	Threat ID	Current UOCAVA Voting System	Voter Authentication	Vote Secrecy	Vote Integrity	Vote Privacy	Auditability	Service Availability
Ballot Marking	Unintentional Disruptions	Error at the Voter's Location	Errors in Obtaining Voter's Assistance	BMK-ERV-ASST	2.442			Х			
Ballot Marking	Unintentional Disruptions	Error at the Voter's Location	Errors in Absentee Ballot Marking	BMK-ERV-MABS	2.874	X		Х		Х	
Ballot Marking	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	BMK-DIS-NATL	0.568					Х	Х
Ballot Marking	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	BMK-DIS-NVRO	0.563					Х	Х
Ballot Marking	Unintentional Disruptions	Accidental Disruptions	Disruptions by Human-Created Collateral Events	BMK-DIS-HUMN	0.535					Х	Х
Marked Ballot Return	Attacks	Insider Attacks	Attacks by Denial of Service	MBR-INS-DOSV	1.001						Х
Marked Ballot Return	Attacks	Insider Attacks	Attacks During Transmission of Marked Ballot Packets	MBR-INS-TMBP	0.907	Х	Х	Х	Х	Х	
Marked Ballot Return	Attacks	Outsider Attacks	Attacks by Denial of Service	MBR-OUT-DOSV	0.972						Х
Marked Ballot Return	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Marked Ballot Packets	MBR-ERT-TMBP	2.371			Х		Х	
Marked Ballot Return	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	MBR-DIS-NATL	0.525			Х		Х	Х
Marked Ballot Return	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	MBR-DIS-NVRO	0.511			Х		Х	Х
Marked Ballot Return	Unintentional Disruptions	Accidental Disruptions	Disruptions by Human-Created Collateral Events	MBR-DIS-HUMN	0.469			Х		Х	X
Returned Ballot Processing											
and Tabulation	Attacks	Insider Attacks	Attacks Against VRDB	RBP-INS-VRDB	0.843	Х		Х		х	х
Returned Ballot Processing											
and Tabulation	Attacks	Insider Attacks	Attacks by Denial of Service	RBP-INS-DOSV	0.823						Х
Returned Ballot Processing											
and Tabulation	Attacks	Insider Attacks	Attacks Against Processing of Returned Ballots	RBP-INS-PRBT	0.938	X	X	Х	Х	Х	Х
Returned Ballot Processing											
and Tabulation	Attacks	Insider Attacks	Attacks Against Tabulation	RBP-INS-TABN	0.812			Х		Х	
Returned Ballot Processing											
and Tabulation	Attacks	Insider Attacks	Attacks Against Adjudication	RBP-INS-ADJN	1.127			Х		Х	
Returned Ballot Processing											i
and Tabulation	Attacks	Outsider Attacks	Attacks by Denial of Service	RBP-OUT-DOSV	0.836						Х
Returned Ballot Processing						х		х		Х	1
and Tabulation	Unintentional Disruptions	Error at the LEO	Errors in VRDB	RBP-ERL-VRDB	1.108	^		^		^	Х
Returned Ballot Processing											
and Tabulation	Unintentional Disruptions	Error at the LEO	Errors in Processing of Returned Ballots	RBP-ERL-PRBT	1.110			Х		Х	
Returned Ballot Processing											
and Tabulation	Unintentional Disruptions	Error at the LEO	Errors in Tabulation	RBP-ERL-TABN	1.002			Х		Х	
Returned Ballot Processing											
and Tabulation	Unintentional Disruptions	Error at the LEO	Errors in Adjudication	RBP-ERL-ADJN	1.373			Х		Х	
Returned Ballot Processing											ı l
and Tabulation	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	RBP-DIS-NATL	0.473			Х		Х	Х
Returned Ballot Processing											ı
and Tabulation	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	RBP-DIS-NVRO	0.529			Х		Х	X
Returned Ballot Processing											ı l
and Tabulation	Unintentional Disruptions	Accidental Disruptions	Disruptions by Human-Created Collateral Events	RBP-DIS-HUMN	0.495			Х		Х	Х
Post-Election Audit	Attacks	Insider Attacks	Attacks Against VRDB	ADT-INS-VRDB	1.073	Х		Х		Х	Х
Post-Election Audit	Attacks	Insider Attacks	Attacks Against Post-Election Audit	ADT-INS-PADT	1.113	Х	X	Х	Х	Х	Х
Post-Election Audit	Unintentional Disruptions	Error at the LEO	Errors in VRDB	ADT-ERL-VRDB	1.239	Х		Х		Х	Х
Post-Election Audit	Unintentional Disruptions	Error at the LEO	Errors in Post-Election Audit	ADT-ERL-PADT	1.094			Х			
Post-Election Audit	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	ADT-DIS-NATL	0.352			Х			Х
Post-Election Audit	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	ADT-DIS-NVRO	0.404			Х			Х
Post-Election Audit	Unintentional Disruptions	Accidental Disruptions	Disruptions by Human-Created Collateral Events	ADT-DIS-HUMN	0.356			Х			Х

Comparative Risk Analysis of the Current UOCAVA Voting System and an Electronic Alternative Report Security Risk Estimates

SECURITY RISK ASSIGNMENT MATRIX - REMOTE ELECTRONIC ABSENTEE VOTING SYSTEM

VOTING STEP	1		THREAT VECTORS		RISK ESTIMATES	SECURITY RISK OF	BJECTIVES				
					Remote Electronic	Voter	Vote Secrecy	Vote	Vote	Auditability	Service
	Level 1	Level 2	Level 3	Threat ID	Absentee Voting System	Authentication	vote secrety	Integrity	Privacy	, tauttubiiity	Availability
Registration	Attacks	Insider Attacks	Attacks Against VRDB	REG-INS-VRDB	1.114	Х		Х		Х	Х
Registration	Attacks	Insider Attacks	Attacks to Voter's Assistance	REG-INS-ASST	0.944			Х			
Registration	Attacks	Insider Attacks	Attacks to Voting Access	REG-INS-ACCS	1.067			Х			Х
Registration	Attacks	Insider Attacks	Attacks by Denial of Service	REG-INS-DOSV	1.517						Х
Registration	Attacks	Insider Attacks	Attacks Against Registration Forms and Instructions	REG-INS-REGF	0.921			Х		Х	Х
Registration	Attacks	Insider Attacks	Attacks During Transmission of Registration Forms and Instructions	REG-INS-TREG	0.908			Х		Х	Х
Registration	Attacks	Insider Attacks	Attacks Against Marking of Registration Forms	REG-INS-MREG	1.276	Х	Х	Х		Х	
Registration	Attacks	Insider Attacks	Attacks During Transmission of Completed Registration Packets	REG-INS-TCRP	1.174	X	X	Х		X	
Registration	Attacks	Insider Attacks	Attacks Against Processing of Completed Registration Packets	REG-INS-PCRP	0.867	X	X	X		X	
Registration	Attacks	Insider Attacks	Attacks During Transmission of Registration Rejections	REG-INS-TRRP	0.945		X				
Registration	Attacks	Outsider Attacks	Attacks Against Voter's Assistance	REG-OUT-ASST	1.638		X	Х			
Registration	Attacks	Outsider Attacks	Attacks Against Voter 9 Assistance	REG-OUT-ACCS	1.476	Х	X	X		Х	Х
Registration	Attacks	Outsider Attacks		REG-OUT-MREG	2.016	X	X	X		X	^
			Attacks Against Marking of Registration Forms				Χ	_			
Registration	Unintentional Disruptions	Error at the LEO	Errors in VRDB	REG-ERL-VRDB	1.134	Х		X		Х	Х
Registration	Unintentional Disruptions	Error at the LEO	Errors in Voter's Assistance	REG-ERL-ASST	1.447			X			
Registration	Unintentional Disruptions	Error at the LEO	Errors in Registration Forms and Instructions	REG-ERL-REGF	1.718			X		X	Х
Registration	Unintentional Disruptions	Error at the LEO	Errors in Processing Completed Registration Packets	REG-ERL-PCRP	1.347	Х	Х	Х		Х	
Registration	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Registration Forms and Instructions	REG-ERT-TREG	1.311			Х		Х	Х
Registration	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Completed Registration Packets	REG-ERT-TCRP	1.605	Х	Х	Х		Х	
Registration	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Registration Rejections	REG-ERT-TRRP	0.925		Х				
Registration	Unintentional Disruptions	Error at the Voter's Location	Errors in Voting Access	REG-ERV-ACCS	2.177						Х
Registration	Unintentional Disruptions	Error at the Voter's Location	Errors in Obtaining Voter's Assistance	REG-ERV-ASST	1.824			Х			
Registration	Unintentional Disruptions	Error at the Voter's Location	Errors in Registration Application	REG-ERV-REGF	2.108			Х		Х	
Registration	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	REG-DIS-NATL	0.507					Х	Х
Registration	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	REG-DIS-NVRO	0.552					Х	Х
Registration	Unintentional Disruptions	Accidental Disruptions	Disruptions by Human-Created Collateral Events	REG-DIS-HUMN	0.739					Х	Х
Absentee Ballot Request	Attacks	Insider Attacks	Attacks Against VRDB	ABR-INS-VRDB	1.125	Х		Х		Х	х
Absentee Ballot Request	Attacks	Insider Attacks	Attacks to Voter's Assistance	ABR-INS-ASST	0.793	~		X			
Absentee Ballot Request	Attacks	Insider Attacks	Attacks to Voting Access	ABR-INS-ACCS	0.933			X			Х
Absentee Ballot Request	Attacks	Insider Attacks	Attacks by Denial of Service	ABR-INS-DOSV	1.491						X
Absentee Ballot Request	Attacks	Insider Attacks	Attacks Against Absentee Ballot Request Forms and Instructions	ABR-INS-ABRF	0.868			Х			X
Absentee Ballot Request	Attacks	Insider Attacks	Attacks During Transmission of Absentee Ballot Request Forms and Instructions	ABR-INS-TABR	0.850			X		Х	X
	Attacks	Insider Attacks	Attacks Against Marking of Absentee Ballot Requests	ABR-INS-MABR	1.599	X	X	X		X	^
Absentee Ballot Request								X		X	
Absentee Ballot Request	Attacks	Insider Attacks	Attacks During Transmission of Completed Absentee Ballot Request Packets	ABR-INS-TCAP	0.978	X	X				
Absentee Ballot Request	Attacks	Insider Attacks	Attacks Against Processing of Completed Absentee Ballot Request Packets	ABR-INS-PCAP	0.837	Х	Х	Х		Х	
Absentee Ballot Request	Attacks	Insider Attacks	Attacks During Transmission of Rejections of Absentee Ballot Requests	ABR-INS-TRAP	0.863		Х				
Absentee Ballot Request	Attacks	Insider Attacks	Attacks Against Absentee Ballots and Instructions	ABR-INS-ABSF	0.924			Х		Х	Х
Absentee Ballot Request	Attacks	Outsider Attacks	Attacks Against Voter's Assistance	ABR-OUT-ASST	1.245			Х			
Absentee Ballot Request	Attacks	Outsider Attacks	Attacks Against Voting Access	ABR-OUT-ACCS	2.100	X	Х	Х		Х	X
Absentee Ballot Request	Attacks	Outsider Attacks	Attacks by Denial of Service	ABR-OUT-DOSV	2.312						Х
Absentee Ballot Request	Attacks	Outsider Attacks	Attacks Against Marking of Absentee Ballot Requests	ABR-OUT-MABR	1.254	Х	Х	Х		Х	
Absentee Ballot Request	Unintentional Disruptions	Error at the LEO	Errors in VRDB	ABR-ERL-VRDB	1.129	X		Х		Х	Х
Absentee Ballot Request	Unintentional Disruptions	Error at the LEO	Errors in Voter's Assistance	ABR-ERL-ASST	1.466			Х			
Absentee Ballot Request	Unintentional Disruptions	Error at the LEO	Errors in Absentee Ballot Request Forms and Instructions	ABR-ERL-ABRF	1.026			Х		Х	Х
Absentee Ballot Request	Unintentional Disruptions	Error at the LEO	Errors in Processing Completed Absentee Ballot Request Packets	ABR-ERL-PCAP	1.150	Х	Х	Х		Х	
Absentee Ballot Request	Unintentional Disruptions	Error at the LEO	Errors in Absentee Ballots and Instructions	ABR-ERL-ABSF	0.956			X		X	Х
Absentee Ballot Request	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Absentee Ballot Request Forms and Instructions	ABR-ERT-TABR	0.782			X		X	X
Absentee Ballot Request	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Completed Absentee Ballot Request Packets	ABR-ERT-TCAP	0.871	Х	Х	X		X	
Absentee Ballot Request	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Completed Absentee Ballot Requests	ABR-ERT-TRAP	0.869	~	X				
Absentee Ballot Request	Unintentional Disruptions	Error at the Voter's Location	Errors in Voting Access	ABR-ERV-ACCS	2.032		^				Х
				ABR-ERV-ACCS ABR-ERV-ASST	1.678			Х			
Absentee Ballot Request	Unintentional Disruptions	Error at the Voter's Location	Errors in Obtaining Voter's Assistance							.,	
Absentee Ballot Request	Unintentional Disruptions	Error at the Voter's Location	Errors in Absentee Ballot Requests	ABR-ERV-ABRF	1.878			Х		X	.,
Absentee Ballot Request	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	ABR-DIS-NATL	0.481					X	X
Absentee Ballot Request	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	ABR-DIS-NVRO	0.511					Х	Х
Absentee Ballot Request	Unintentional Disruptions	Accidental Disruptions	Disruptions by Human-Created Collateral Events	ABR-DIS-HUMN	0.459					Х	Х
Absentee Ballot Delivery	Attacks	Insider Attacks	Attacks by Denial of Service	ABD-INS-DOSV	1.327						Х
Absentee Ballot Delivery	Attacks	Insider Attacks	Attacks During Transmission of Absentee Ballot and Instructions	ABD-INS-TABS	0.758			Х		Х	Х
Absentee Ballot Delivery	Attacks	Outsider Attacks	Attacks Against Voting Access	ABD-OUT-ACCS	2.199	X	X	Х		X	Х

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VOTING STEP	TEP THEAT VECTORS RISK ESTIMATES SECURITY RISK OBJECTIVES										
	Level 1	Level 2	Level 3	Threat ID	Remote Electronic Absentee Voting System	Voter Authentication	Vote Secrecy	Vote Integrity	Vote Privacy	Auditability	Service Availability
Absentee Ballot Delivery	Attacks	Outsider Attacks	Attacks by Denial of Service	ABD-OUT-DOSV	2.494						X
Absentee Ballot Delivery	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Absentee Ballot and Instructions	ABD-ERT-TABS	0.747			Х		Х	Х
Absentee Ballot Delivery	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	ABD-DIS-NATL	0.332						Х
Absentee Ballot Delivery	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	ABD-DIS-NVRO	0.383						Х
Absentee Ballot Delivery	Unintentional Disruptions	Accidental Disruptions	Disruptions by Human-Created Collateral Events	ABD-DIS-HUMN	0.351						Х
Ballot Marking	Attacks	Insider Attacks	Attacks Against Marking Absentee Ballots and Forms	BMK-INS-MABS	1.088	X	Х	Х	Х	Х	
Ballot Marking	Attacks	Outsider Attacks	Attacks Against Marking Absentee Ballots and Forms	BMK-OUT-MABS	1.493	Х	Х	Х	Х	Х	
Ballot Marking	Unintentional Disruptions	Error at the Voter's Location	Errors in Voting Access	BMK-ERV-ACCS	1.740						Х
Ballot Marking	Unintentional Disruptions	Error at the Voter's Location	Errors in Obtaining Voter's Assistance	BMK-ERV-ASST	1.185			Х			
Ballot Marking	Unintentional Disruptions	Error at the Voter's Location	Errors in Absentee Ballot Marking	BMK-ERV-MABS	1.681	Х		Х		Х	
Ballot Marking	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	BMK-DIS-NATL	0.564					X	Х
Ballot Marking	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	BMK-DIS-NVRO	0.607					X	X
Ballot Marking	Unintentional Disruptions	Accidental Disruptions	Disruptions by Human-Created Collateral Events	BMK-DIS-HUMN	0.598					X	X
Marked Ballot Return	Attacks	Insider Attacks	Attacks by Denial of Service	MBR-INS-DOSV	1.101						X
Marked Ballot Return	Attacks	Insider Attacks	Attacks During Transmission of Marked Ballot Packets	MBR-INS-TMBP	0.966	Х	X	Х	X	X	
Marked Ballot Return	Attacks	Outsider Attacks	Attacks Against Voting Access	MBR-OUT-ACCS	1.740	X	X	X	X	X	Х
Marked Ballot Return	Attacks	Outsider Attacks Outsider Attacks	Attacks Against voting access Attacks by Denial of Service	MBR-OUT-DOSV	1.907	^	^	^	^	^	X
				MBR-ERT-TMBP	0.848			Х		X	
Marked Ballot Return	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Marked Ballot Packets					X			V
Marked Ballot Return	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	MBR-DIS-NATL	0.365					X	X
Marked Ballot Return	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	MBR-DIS-NVRO	0.430			Х		Х	Х
Marked Ballot Return	Unintentional Disruptions	Accidental Disruptions	Disruptions by Human-Created Collateral Events	MBR-DIS-HUMN	0.409			Х		Х	Х
Returned Ballot Processing											I
and Tabulation	Attacks	Insider Attacks	Attacks Against VRDB	RBP-INS-VRDB	0.820	X		Х		Х	Х
Returned Ballot Processing											1
and Tabulation	Attacks	Insider Attacks	Attacks by Denial of Service	RBP-INS-DOSV	0.697						Х
Returned Ballot Processing											ı
and Tabulation	Attacks	Insider Attacks	Attacks Against Processing of Returned Ballots	RBP-INS-PRBT	0.767	X	Х	Х	Х	Х	Х
Returned Ballot Processing											i
and Tabulation	Attacks	Insider Attacks	Attacks Against Tabulation	RBP-INS-TABN	0.755			Х		Х	
Returned Ballot Processing											
and Tabulation	Attacks	Insider Attacks	Attacks Against Adjudication	RBP-INS-ADJN	0.831			Х		X	
Returned Ballot Processing											
and Tabulation	Attacks	Outsider Attacks	Attacks by Denial of Service	RBP-OUT-DOSV	2.141						Х
Returned Ballot Processing						.,		,		.,	
and Tabulation	Unintentional Disruptions	Error at the LEO	Errors in VRDB	RBP-ERL-VRDB	1.053	Х		Х		Х	X
Returned Ballot Processing											
and Tabulation	Unintentional Disruptions	Error at the LEO	Errors in Processing of Returned Ballots	RBP-ERL-PRBT	0.937			Х		X	ĺ
Returned Ballot Processing											
and Tabulation	Unintentional Disruptions	Error at the LEO	Errors in Tabulation	RBP-ERL-TABN	0.991			Х		х	i
Returned Ballot Processing											
and Tabulation	Unintentional Disruptions	Error at the LEO	Errors in Adjudication	RBP-ERL-ADJN	0.845			х		Х	
Returned Ballot Processing											
and Tabulation	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	RBP-DIS-NATL	0.464			х		Х	Х
Returned Ballot Processing			, ,								
and Tabulation	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	RBP-DIS-NVRO	0.521			х		Х	Х
Returned Ballot Processing											
and Tabulation	Unintentional Disruptions	Accidental Disruptions	Disruptions by Human-Created Collateral Events	RBP-DIS-HUMN	0.465			x		x	x
Post-Election Audit	Attacks	Insider Attacks	Attacks Against VRDB	ADT-INS-VRDB	0.754	х		X		X	X
Post-Election Audit	Attacks	Insider Attacks	Attacks Against Post-Election Audit	ADT-INS-PADT	0.788	X	X	X	Х	X	X
Post-Election Audit	Unintentional Disruptions	Error at the LEO	Errors in VRDB	ADT-ERL-VRDB	0.788	X	^	X	^	X	X
Post-Election Audit	Unintentional Disruptions	Error at the LEO	Errors in Post-Election Audit	ADT-ERL-PADT	0.815	^		X		^	^
				+							
Post-Election Audit	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	ADT-DIS-NATL	0.307 0.369			X			X
Post-Election Audit	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	ADT-DIS-NVRO				X			X
Post-Election Audit	Unintentional Disruptions	Accidental Disruptions	Disruptions by Human-Created Collateral Events	ADT-DIS-HUMN	0.321			X			X

Specific to a remote absentee electronic voting environment

Comparative Risk Analysis of the Current UOCAVA Voting System and an Electronic Alternative Report Security Risk Estimates

SECURITY RISK ESTIMATES - CURRENT UOCAVA VOTING SYSTEM

VOTING STEP	I	SECURITY RISK OBJECTIVES								
			THREAT VECTORS		Voter		Vote	Vote		Service
	Level 1	Level 2	Level 3	Threat ID	Authentication	Vote Secrecy	Integrity	Privacy	Auditability	Availability
Registration	Attacks	Insider Attacks	Attacks Against VRDB	REG-INS-VRDB	1.061		1.061		1.061	1.061
Registration	Attacks	Insider Attacks	Attacks to Voter's Assistance	REG-INS-ASST			0.859			
Registration	Attacks	Insider Attacks	Attacks to Voting Access	REG-INS-ACCS			1.045			1.045
Registration	Attacks	Insider Attacks	Attacks by Denial of Service	REG-INS-DOSV						0.814
Registration	Attacks	Insider Attacks	Attacks Against Registration Forms and Instructions	REG-INS-REGF			0.839		0.839	0.839
Registration	Attacks	Insider Attacks	Attacks During Transmission of Registration Forms and Instructions	REG-INS-TREG			0.838		0.838	0.838
Registration	Attacks	Insider Attacks	Attacks During Transmission of Completed Registration Packets	REG-INS-TCRP	1.042	1.042	1.042		1.042	
Registration	Attacks	Insider Attacks	Attacks Against Processing of Completed Registration Packets	REG-INS-PCRP	1.108	1.108	1.108		1.108	
Registration	Attacks	Insider Attacks	Attacks During Transmission of Registration Rejections	REG-INS-TRRP		0.826				
Registration	Attacks	Outsider Attacks	Attacks Against Voter's Assistance	REG-OUT-ASST			1.039			
Registration	Attacks	Outsider Attacks	Attacks Against Marking of Registration Forms	REG-OUT-MREG	1.471	1.471	1.471		1.471	
Registration	Unintentional Disruptions	Error at the LEO	Errors in VRDB	REG-ERL-VRDB	1.131		1.131		1.131	1.131
Registration	Unintentional Disruptions	Error at the LEO	Errors in Voter's Assistance	REG-ERL-ASST			2.228			
Registration	Unintentional Disruptions	Error at the LEO	Errors in Registration Forms and Instructions	REG-ERL-REGF			1.125		1.125	1.125
Registration	Unintentional Disruptions	Error at the LEO	Errors in Processing Completed Registration Packets	REG-ERL-PCRP	1.176	1.176	1.176		1.176	
Registration	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Registration Forms and Instructions	REG-ERT-TREG			1.389		1.389	1.389
Registration	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Completed Registration Packets	REG-ERT-TCRP	1.171	1.171	1.171		1.171	
Registration	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Registration Rejections	REG-ERT-TRRP		1.036				
Registration	Unintentional Disruptions	Error at the Voter's Location	Errors in Voting Access	REG-ERV-ACCS						2.985
Registration	Unintentional Disruptions	Error at the Voter's Location	Errors in Obtaining Voter's Assistance	REG-ERV-ASST			2.035			
Registration	Unintentional Disruptions	Error at the Voter's Location	Errors in Registration Application	REG-ERV-REGF			2.959		2.959	
Registration	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	REG-DIS-NATL					1.360	1.360
Registration	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	REG-DIS-NVRO					0.797	0.797
Registration	Unintentional Disruptions	Accidental Disruptions	Disruptions by Human-Created Collateral Events	REG-DIS-HUMN					0.797	0.797
Absentee Ballot Request	Attacks	Insider Attacks	Attacks Against VRDB	ABR-INS-VRDB	1.128		1.128		1.128	1.128
Absentee Ballot Request	Attacks	Insider Attacks	Attacks to Voter's Assistance	ABR-INS-ASST			0.875			
Absentee Ballot Request	Attacks	Insider Attacks	Attacks to Voting Access	ABR-INS-ACCS			0.914			0.914
Absentee Ballot Request	Attacks	Insider Attacks	Attacks by Denial of Service	ABR-INS-DOSV						0.796
Absentee Ballot Request	Attacks	Insider Attacks	Attacks Against Absentee Ballot Request Forms and Instructions	ABR-INS-ABRF			0.859			0.859
Absentee Ballot Request	Attacks	Insider Attacks	Attacks During Transmission of Absentee Ballot Request Forms and Instructions	ABR-INS-TABR			0.769		0.769	0.769
Absentee Ballot Request	Attacks	Insider Attacks	Attacks During Transmission of Completed Absentee Ballot Request Packets	ABR-INS-TCAP	0.954	0.954	0.954		0.954	0.703
Absentee Ballot Request	Attacks	Insider Attacks	Attacks Against Processing of Completed Absentee Ballot Request Packets	ABR-INS-PCAP	1.001	1.001	1.001		1.001	
Absentee Ballot Request	Attacks	Insider Attacks	Attacks During Transmission of Rejections of Absentee Ballot Requests	ABR-INS-TRAP	1.001	0.843	1.001		1.001	
Absentee Ballot Request	Attacks	Insider Attacks	Attacks Against Absentee Ballots and Instructions	ABR-INS-ABSF		0.0.15	0.826		0.826	0.826
Absentee Ballot Request	Attacks	Outsider Attacks	Attacks Against Voter's Assistance	ABR-OUT-ASST			1.192			
Absentee Ballot Request	Attacks	Outsider Attacks	Attacks by Denial of Service	ABR-OUT-DOSV						0.901
Absentee Ballot Request	Attacks	Outsider Attacks	Attacks Against Marking of Absentee Ballot Requests	ABR-OUT-MABR	1,344	1.344	1.344		1.344	
Absentee Ballot Request	Unintentional Disruptions	Error at the LEO	Errors in VRDB	ABR-ERL-VRDB	1.098		1.098		1.098	1.098
Absentee Ballot Request	Unintentional Disruptions	Error at the LEO	Errors in Voter's Assistance	ABR-ERL-ASST	1.050		1.884		1.050	
Absentee Ballot Request	Unintentional Disruptions	Error at the LEO	Errors in Absentee Ballot Request Forms and Instructions	ABR-ERL-ABRF			1.149		1.149	1.149
Absentee Ballot Request	Unintentional Disruptions	Error at the LEO	Errors in Processing Completed Absentee Ballot Request Packets	ABR-ERL-PCAP	1.047	1.047	1.047		1.047	
Absentee Ballot Request	Unintentional Disruptions	Error at the LEO	Errors in Absentee Ballots and Instructions	ABR-ERL-ABSF			1.365		1.365	1.365
Absentee Ballot Request	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Absentee Ballot Request Forms and Instructions	ABR-ERT-TABR			1.157		1.157	1.157
Absentee Ballot Request	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Completed Absentee Ballot Request Packets	ABR-ERT-TCAP	1.092	1.092	1.092		1.092	1.137
Absentee Ballot Request	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Rejections of Absentee Ballot Requests	ABR-ERT-TRAP	1.032	1.025	1.032		1.032	
Absentee Ballot Request	Unintentional Disruptions	Error at the Voter's Location	Errors in Voting Access	ABR-ERV-ACCS		1.025				2.905
Absentee Ballot Request	Unintentional Disruptions	Error at the Voter's Location	Errors in Obtaining Voter's Assistance	ABR-ERV-ASST			2.196			2.505
Absentee Ballot Request	Unintentional Disruptions	Error at the Voter's Location	Errors in Absentee Ballot Requests	ABR-ERV-ABRF			2.689		2.689	
Absentee Ballot Request	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	ABR-DIS-NATL			2.003		1.039	1.039
Absentee Ballot Request	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	ABR-DIS-NVRO					0.732	0.732
Absentee Ballot Request	Unintentional Disruptions	Accidental Disruptions	Disruptions by Human-Created Collateral Events	ABR-DIS-HUMN					1.113	1.113
Absentee Ballot Delivery	Attacks	Insider Attacks	Attacks by Denial of Service	ABD-INS-DOSV					1,113	0.924
Absentee Ballot Delivery	Attacks	Insider Attacks	Attacks During Transmission of Absentee Ballot and Instructions	ABD-INS-TABS			0.834		0.834	0.924
Absentee Ballot Delivery	Attacks	Outsider Attacks	Attacks by Denial of Service	ABD-OUT-DOSV			0.034		0.034	0.834
Absentee Ballot Delivery	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Absentee Ballot and Instructions	ABD-ERT-TABS			1.700		1.700	1.700
Absentee Ballot Delivery	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	ABD-ERT-TABS ABD-DIS-NATL			1.700		1.700	0.570
			· · · ·							
Absentee Ballot Delivery	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	ABD-DIS-NVRO						0.607 0.568
Absentee Ballot Delivery	Unintentional Disruptions Attacks	Accidental Disruptions	Disruptions by Human-Created Collateral Events	ABD-DIS-HUMN	1.271	1.271	1.271	1.271	1.271	0.508
Ballot Marking		Outsider Attacks	Attacks Against Marking Absentee Ballots and Forms	BMK-OUT-MABS	1.2/1	1.2/1	1.2/1	1.2/1	1.2/1	2 507
Ballot Marking	Unintentional Disruptions	Error at the Voter's Location	Errors in Voting Access	BMK-ERV-ACCS						2.507

Comparative Risk Analysis of the Current UOCAVA Voting System and an Electronic Alternative Report Security Risk Estimates

SECURITY RISK ESTIMATES - CURRENT UOCAVA VOTING SYSTEM

VOTING STEP			THREAT VECTORS		SECURITY RISK OBJECTIVES								
	Level 1	Level 2	Level 3	Threat ID	Voter Authentication	Vote Secrecy	Vote Integrity	Vote Privacy	Auditability	Service Availability			
Ballot Marking	Unintentional Disruptions	Error at the Voter's Location	Errors in Obtaining Voter's Assistance	BMK-ERV-ASST			2.442						
Ballot Marking	Unintentional Disruptions	Error at the Voter's Location	Errors in Absentee Ballot Marking	BMK-ERV-MABS	2.874		2.874		2.874				
Ballot Marking	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	BMK-DIS-NATL					0.568	0.568			
Ballot Marking	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	BMK-DIS-NVRO					0.563	0.563			
Ballot Marking	Unintentional Disruptions	Accidental Disruptions	Disruptions by Human-Created Collateral Events	BMK-DIS-HUMN					0.535	0.535			
Marked Ballot Return	Attacks	Insider Attacks	Attacks by Denial of Service	MBR-INS-DOSV						1.001			
Marked Ballot Return	Attacks	Insider Attacks	Attacks During Transmission of Marked Ballot Packets	MBR-INS-TMBP	0.907	0.907	0.907	0.907	0.907				
Marked Ballot Return	Attacks	Outsider Attacks	Attacks by Denial of Service	MBR-OUT-DOSV						0.972			
Marked Ballot Return	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Marked Ballot Packets	MBR-ERT-TMBP			2.371		2.371				
Marked Ballot Return	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	MBR-DIS-NATL			0.525		0.525	0.525			
Marked Ballot Return	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	MBR-DIS-NVRO			0.511		0.511	0.511			
Marked Ballot Return	Unintentional Disruptions	Accidental Disruptions	Disruptions by Human-Created Collateral Events	MBR-DIS-HUMN			0.469		0.469	0.469			
Returned Ballot Processing													
and Tabulation	Attacks	Insider Attacks	Attacks Against VRDB	RBP-INS-VRDB	0.843		0.843		0.843	0.843			
Returned Ballot Processing													
and Tabulation	Attacks	Insider Attacks	Attacks by Denial of Service	RBP-INS-DOSV						0.823			
Returned Ballot Processing													
and Tabulation	Attacks	Insider Attacks	Attacks Against Processing of Returned Ballots	RBP-INS-PRBT	0.938	0.938	0.938	0.938	0.938	0.938			
Returned Ballot Processing													
and Tabulation	Attacks	Insider Attacks	Attacks Against Tabulation	RBP-INS-TABN			0.812		0.812	0.812			
Returned Ballot Processing													
and Tabulation	Attacks	Insider Attacks	Attacks Against Adjudication	RBP-INS-ADJN			1.127		1.127	1.127			
Returned Ballot Processing										ı l			
and Tabulation	Attacks	Outsider Attacks	Attacks by Denial of Service	RBP-OUT-DOSV						0.836			
Returned Ballot Processing					1.108		1.108		1.108	ı l			
and Tabulation	Unintentional Disruptions	Error at the LEO	Errors in VRDB	RBP-ERL-VRDB	1.100		1.100		1.100	1.108			
Returned Ballot Processing													
and Tabulation	Unintentional Disruptions	Error at the LEO	Errors in Processing of Returned Ballots	RBP-ERL-PRBT			1.110		1.110				
Returned Ballot Processing										i			
and Tabulation	Unintentional Disruptions	Error at the LEO	Errors in Tabulation	RBP-ERL-TABN			1.002		1.002				
Returned Ballot Processing and Tabulation													
	Unintentional Disruptions	Error at the LEO	Errors in Adjudication	RBP-ERL-ADJN			1.373		1.373				
Returned Ballot Processing and Tabulation	Heistoria - Dissortion	Assidental Discounties	Discretions by Material County	DDD DIC MATI			0.473		0.472	0.472			
	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	RBP-DIS-NATL			0.473		0.473	0.473			
Returned Ballot Processing and Tabulation	Haintantianal Diametiana	Assidental Discounties	Discountings by Equipment of Equator	DDD DIC NIVDO			0.530		0.529	0.529			
Returned Ballot Processing	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	RBP-DIS-NVRO			0.529		0.529	0.529			
and Tabulation	Unintentional Discussional	Accidental Disruptions	Disruptions by Human-Created Collateral Events	RBP-DIS-HUMN			0.495		0.495	0.495			
	Unintentional Disruptions Attacks	Insider Attacks	/	ADT-INS-VRDB	1.073		1.073		1.073	1.073			
Post-Election Audit Post-Election Audit	Attacks	Insider Attacks	Attacks Against VRDB Attacks Against Post-Election Audit	ADT-INS-VRDB ADT-INS-PADT	1.113	1.113	1.113	1.113	1.073	1.073			
Post-Election Audit Post-Election Audit		Error at the LEO	Attacks Against Post-Election Audit Errors in VRDB			1.113		1.113		1.113			
Post-Election Audit Post-Election Audit	Unintentional Disruptions	Error at the LEO	Errors in Post-Election Audit	ADT-ERL-VRDB ADT-ERL-PADT	1.239		1.239 1.094		1.239	1.239			
	Unintentional Disruptions		Disruptions by Natural Events	ADT-DIS-NATL			0.352			0.352			
Post-Election Audit	Unintentional Disruptions	Accidental Disruptions	,				0.352			0.352			
Post-Election Audit	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	ADT-DIS-NVRO						0.10			
Post-Election Audit	Unintentional Disruptions	Accidental Disruptions	Disruptions by Human-Created Collateral Events	ADT-DIS-HUMN			0.356			0.356			

Comparative Risk Analysis of the Current UOCAVA Voting System and an Electronic Alternative Report Security Risk Estimates

SECURITY RISK ESTIMATES - REMOTE ELECTRONIC ABSENTEE VOTING SYSTEM

VOTING STEP			THREAT VECTORS		SECURITY RISK O	BJECTIVES				
	Laural d	1	Level 2	Threat ID	Voter	Vote Secrecy	Vote	Vote	Auditability	Service Availability
B. et al. et al. et	Level 1	Level 2	Level 3	Threat ID	Authentication	,	Integrity	Privacy	· ·	
Registration	Attacks	Insider Attacks	Attacks Against VRDB	REG-INS-VRDB	1.114		1.114		1.114	1.114
Registration	Attacks	Insider Attacks	Attacks to Voter's Assistance	REG-INS-ASST REG-INS-ACCS			0.944			4.067
Registration	Attacks Attacks	Insider Attacks Insider Attacks	Attacks to Voting Access Attacks by Denial of Service	REG-INS-ACCS REG-INS-DOSV			1.067			1.067 1.517
Registration			,				0.021		0.921	
Registration	Attacks Attacks	Insider Attacks	Attacks Against Registration Forms and Instructions	REG-INS-REGF REG-INS-TREG			0.921		0.921	0.921 0.908
Registration		Insider Attacks	Attacks During Transmission of Registration Forms and Instructions	REG-INS-TREG	1 270	1.276	1.276		1.276	0.908
Registration	Attacks Attacks	Insider Attacks Insider Attacks	Attacks Against Marking of Registration Forms Attacks During Transmission of Completed Registration Packets	REG-INS-TCRP	1.276 1.174	1.174	1.174		1.174	
Registration Registration	Attacks	Insider Attacks	Attacks Against Processing of Completed Registration Packets	REG-INS-PCRP	0.867	0.867	0.867		0.867	
Registration	Attacks	Insider Attacks	Attacks During Transmission of Registration Rejections	REG-INS-TRRP	0.867	0.945	0.807		0.867	
Registration	Attacks	Outsider Attacks	Attacks Against Voter's Assistance	REG-OUT-ASST		0.943	1.638			
Registration	Attacks	Outsider Attacks	Attacks Against Voting Access	REG-OUT-ACCS	1.476	1.476	1.476		1.476	1.476
Registration	Attacks	Outsider Attacks	Attacks Against Marking of Registration Forms	REG-OUT-MREG	2.016	2.016	2.016		2.016	1.470
Registration	Unintentional Disruptions	Error at the LEO	Frrors in VRDB	REG-ERL-VRDB	1.134	2.010	1.134		1.134	1.134
Registration	Unintentional Disruptions	Error at the LEO	Errors in Voter's Assistance	REG-ERL-ASST	1.154		1.447		1.134	1.154
Registration	Unintentional Disruptions	Error at the LEO	Errors in Registration Forms and Instructions	REG-ERL-REGF			1.718		1.718	1.718
Registration	Unintentional Disruptions	Error at the LEO	Errors in Processing Completed Registration Packets	REG-ERL-PCRP	1.347	1.347	1.347		1.347	1.710
Registration	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Registration Forms and Instructions	REG-ERT-TREG	1.347	1.34/	1.311		1.311	1.311
Registration	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Registration Forms and Instructions	REG-ERT-TCRP	1.605	1.605	1.605		1.605	1.511
Registration	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Registration Rejections	REG-ERT-TRRP	1.005	0.925	1.003		1.005	
Registration	Unintentional Disruptions	Error at the Voter's Location	Errors in Voting Access	REG-ERV-ACCS		0.525				2.177
Registration	Unintentional Disruptions	Error at the Voter's Location	Errors in Obtaining Voter's Assistance	REG-ERV-ASST			1.824			2.177
Registration	Unintentional Disruptions	Error at the Voter's Location	Errors in Registration Application	REG-ERV-REGF			2.108		2,108	
Registration	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	REG-DIS-NATL			2.108		0.507	0.507
Registration	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	REG-DIS-NVRO					0.552	0.552
Registration	Unintentional Disruptions	Accidental Disruptions	Disruptions by Human-Created Collateral Events	REG-DIS-HUMN					0.739	0.739
Absentee Ballot Request	Attacks	Insider Attacks	Attacks Against VRDB	ABR-INS-VRDB	1.125		1.125		1.125	1.125
Absentee Ballot Request	Attacks	Insider Attacks	Attacks to Voter's Assistance	ABR-INS-ASST	1.125		0.793		1.123	1.125
Absentee Ballot Request	Attacks	Insider Attacks	Attacks to Voting Access	ABR-INS-ACCS			0.933			0.933
Absentee Ballot Request	Attacks	Insider Attacks	Attacks by Denial of Service	ABR-INS-DOSV			0.555			1.491
Absentee Ballot Request	Attacks	Insider Attacks	Attacks Against Absentee Ballot Request Forms and Instructions	ABR-INS-ABRF			0.868			0.868
Absentee Ballot Request	Attacks	Insider Attacks	Attacks During Transmission of Absentee Ballot Request Forms and Instructions	ABR-INS-TABR			0.850		0.850	0.850
Absentee Ballot Request	Attacks	Insider Attacks	Attacks Against Marking of Absentee Ballot Requests	ABR-INS-MABR	1.599	1.599	1.599		1.599	0.050
Absentee Ballot Request	Attacks	Insider Attacks	Attacks During Transmission of Completed Absentee Ballot Request Packets	ABR-INS-TCAP	0.978	0.978	0.978		0.978	
Absentee Ballot Request	Attacks	Insider Attacks	Attacks Against Processing of Completed Absentee Ballot Request Packets	ABR-INS-PCAP	0.837	0.837	0.837		0.837	
Absentee Ballot Request	Attacks	Insider Attacks	Attacks During Transmission of Rejections of Absentee Ballot Requests	ABR-INS-TRAP		0.863				
Absentee Ballot Request	Attacks	Insider Attacks	Attacks Against Absentee Ballots and Instructions	ABR-INS-ABSF		0.000	0.924		0.924	0.924
Absentee Ballot Request	Attacks	Outsider Attacks	Attacks Against Voter's Assistance	ABR-OUT-ASST			1.245			
Absentee Ballot Request	Attacks	Outsider Attacks	Attacks Against Voting Access	ABR-OUT-ACCS	2.100	2.100	2.100		2.100	2.100
Absentee Ballot Request	Attacks	Outsider Attacks	Attacks by Denial of Service	ABR-OUT-DOSV						2.312
Absentee Ballot Request	Attacks	Outsider Attacks	Attacks Against Marking of Absentee Ballot Requests	ABR-OUT-MABR	1.254	1.254	1.254		1.254	
Absentee Ballot Request	Unintentional Disruptions	Error at the LEO	Errors in VRDB	ABR-ERL-VRDB	1.129		1.129		1.129	1.129
Absentee Ballot Request	Unintentional Disruptions	Error at the LEO	Errors in Voter's Assistance	ABR-ERL-ASST			1.466			
Absentee Ballot Request	Unintentional Disruptions	Error at the LEO	Errors in Absentee Ballot Request Forms and Instructions	ABR-ERL-ABRF			1.026		1.026	1.026
Absentee Ballot Request	Unintentional Disruptions	Error at the LEO	Errors in Processing Completed Absentee Ballot Request Packets	ABR-ERL-PCAP	1.150	1.150	1.150		1.150	
Absentee Ballot Request	Unintentional Disruptions	Error at the LEO	Errors in Absentee Ballots and Instructions	ABR-ERL-ABSF			0.956		0.956	0.956
Absentee Ballot Request	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Absentee Ballot Request Forms and Instructions	ABR-ERT-TABR			0.782		0.782	0.782
Absentee Ballot Request	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Completed Absentee Ballot Request Packets	ABR-ERT-TCAP	0.871	0.871	0.871		0.871	
Absentee Ballot Request	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Rejections of Absentee Ballot Requests	ABR-ERT-TRAP		0.869				
Absentee Ballot Request	Unintentional Disruptions	Error at the Voter's Location	Errors in Voting Access	ABR-ERV-ACCS						2.032
Absentee Ballot Request	Unintentional Disruptions	Error at the Voter's Location	Errors in Obtaining Voter's Assistance	ABR-ERV-ASST			1.678			
Absentee Ballot Request	Unintentional Disruptions	Error at the Voter's Location	Errors in Absentee Ballot Requests	ABR-ERV-ABRF			1.878		1.878	
Absentee Ballot Request	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	ABR-DIS-NATL					0.481	0.481
Absentee Ballot Request	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	ABR-DIS-NVRO					0.511	0.511
Absentee Ballot Request	Unintentional Disruptions	Accidental Disruptions	Disruptions by Human-Created Collateral Events	ABR-DIS-HUMN					0.459	0.459
Absentee Ballot Delivery	Attacks	Insider Attacks	Attacks by Denial of Service	ABD-INS-DOSV						1.353
Absentee Ballot Delivery	Attacks	Insider Attacks	Attacks During Transmission of Absentee Ballot and Instructions	ABD-INS-TABS			0.782		0.782	0.782
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Comparative Risk Analysis of the Current UOCAVA Voting System and an Electronic Alternative Report Security Risk Estimates

SECURITY RISK ESTIMATES - REMOTE ELECTRONIC ABSENTEE VOTING SYSTEM

VOTING STEP			THREAT VECTORS		SECURITY RISK O	BJECTIVES				
	Level 1	Level 2	Level 3	Threat ID	Voter	Vote Secrecy	Vote	Vote	Auditability	Service Availability
			<u>I</u>		Authentication		Integrity	Privacy	_	1
Absentee Ballot Delivery	Attacks	Outsider Attacks	Attacks Against Voting Access	ABD-OUT-ACCS	2.225	2.225	2.225		2.225	2.225
Absentee Ballot Delivery	Attacks	Outsider Attacks	Attacks by Denial of Service	ABD-OUT-DOSV			0.700		0.700	2.518
Absentee Ballot Delivery	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Absentee Ballot and Instructions	ABD-ERT-TABS			0.780		0.780	0.780
Absentee Ballot Delivery	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	ABD-DIS-NATL						0.342
Absentee Ballot Delivery	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	ABD-DIS-NVRO						0.395
Absentee Ballot Delivery	Unintentional Disruptions	Accidental Disruptions	Disruptions by Human-Created Collateral Events	ABD-DIS-HUMN BMK-INS-MABS	1.114	1.114	1.114	1.114	1.114	0.362
Ballot Marking	Attacks	Insider Attacks	Attacks Against Marking Absentee Ballots and Forms							
Ballot Marking	Attacks	Outsider Attacks	Attacks Against Marking Absentee Ballots and Forms	BMK-OUT-MABS	1.524	1.524	1.524	1.524	1.524	1.779
Ballot Marking	Unintentional Disruptions	Error at the Voter's Location	Errors in Voting Access	BMK-ERV-ACCS						1.779
Ballot Marking	Unintentional Disruptions	Error at the Voter's Location	Errors in Obtaining Voter's Assistance	BMK-ERV-ASST	4.607		1.222		4.607	
Ballot Marking	Unintentional Disruptions	Error at the Voter's Location	Errors in Absentee Ballot Marking	BMK-ERV-MABS	1.697		1.697		1.697	0.554
Ballot Marking	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	BMK-DIS-NATL					0.574	0.574
Ballot Marking	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	BMK-DIS-NVRO					0.617	0.617
Ballot Marking	Unintentional Disruptions	Accidental Disruptions	Disruptions by Human-Created Collateral Events	BMK-DIS-HUMN					0.609	0.609
Marked Ballot Return	Attacks	Insider Attacks	Attacks by Denial of Service	MBR-INS-DOSV						1.127
Marked Ballot Return	Attacks	Insider Attacks	Attacks During Transmission of Marked Ballot Packets	MBR-INS-TMBP	0.998	0.998	0.998	0.998	0.998	
Marked Ballot Return	Attacks	Outsider Attacks	Attacks Against Voting Access	MBR-OUT-ACCS	1.759	1.759	1.759	1.759	1.759	1.759
Marked Ballot Return	Attacks	Outsider Attacks	Attacks by Denial of Service	MBR-OUT-DOSV						1.924
Marked Ballot Return	Unintentional Disruptions	Error in Transmission	Errors in Transmission of Marked Ballot Packets	MBR-ERT-TMBP			0.859		0.859	
Marked Ballot Return	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	MBR-DIS-NATL			0.376		0.376	0.376
Marked Ballot Return	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	MBR-DIS-NVRO			0.440		0.440	0.440
Marked Ballot Return	Unintentional Disruptions	Accidental Disruptions	Disruptions by Human-Created Collateral Events	MBR-DIS-HUMN			0.420		0.420	0.420
Returned Ballot Processing										
and Tabulation	Attacks	Insider Attacks	Attacks Against VRDB	RBP-INS-VRDB	0.820		0.820		0.820	0.820
Returned Ballot Processing										
and Tabulation	Attacks	Insider Attacks	Attacks by Denial of Service	RBP-INS-DOSV						0.697
Returned Ballot Processing										
and Tabulation	Attacks	Insider Attacks	Attacks Against Processing of Returned Ballots	RBP-INS-PRBT	0.767	0.767	0.767	0.767	0.767	0.767
Returned Ballot Processing										
and Tabulation	Attacks	Insider Attacks	Attacks Against Tabulation	RBP-INS-TABN			0.755		0.755	
Returned Ballot Processing										
and Tabulation	Attacks	Insider Attacks	Attacks Against Adjudication	RBP-INS-ADJN			0.831		0.831	
Returned Ballot Processing			,							
and Tabulation	Attacks	Outsider Attacks	Attacks by Denial of Service	RBP-OUT-DOSV						2.141
Returned Ballot Processing										
and Tabulation	Unintentional Disruptions	Error at the LEO	Errors in VRDB	RBP-ERL-VRDB	1.053		1.053		1.053	1.053
Returned Ballot Processing	Ommendonal Disrapcions	Error at the 220	End of the Control of	NOT ENE VIOL						1.055
and Tabulation	Unintentional Disruptions	Error at the LEO	Errors in Processing of Returned Ballots	RBP-ERL-PRBT			0.937		0.937	
Returned Ballot Processing	Ommendonal Disraptions	Error at the 220	Errors in Frocessing of Netamed Bullots	NO. ENETHOI			0.337		0.557	
and Tabulation	Unintentional Disruptions	Error at the LEO	Errors in Tabulation	RBP-ERL-TABN			0.991		0.991	
Returned Ballot Processing	Ommendonal Disrapcions	Error at the 220	End of the Indiana.	NOT ENE TABLE			0.331		0.551	
and Tabulation	Unintentional Disruptions	Error at the LEO	Errors in Adjudication	RBP-ERL-ADJN			0.845		0.845	
Returned Ballot Processing	Offinteritional Distuptions	Ellor at the EEO	Errors in Adjudication	NDF-ENE-ADJIN			0.843		0.843	
and Tabulation	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	RBP-DIS-NATL			0.464		0.464	0.464
Returned Ballot Processing	Ommentional Disruptions	Accidental Distuptions	Distributions by Natural Events	NOT-DIS-NATE			0.404		0.404	0.404
and Tabulation	Unintentional Discustions	Accidental Disruptions	Discriptions by Environmental Events	RBP-DIS-NVRO			0.521		0.521	0.521
Returned Ballot Processing	Unintentional Disruptions	Accidental Distuptions	Disruptions by Environmental Events	טאיאו-כות- זמא			0.521		0.321	0.321
and Tabulation	Unintentional Discustings	Assidental Discustions	Discriptions by Human Created Collatoral Events	RBP-DIS-HUMN			0.465		0.465	0.465
	Unintentional Disruptions	Accidental Disruptions	Disruptions by Human-Created Collateral Events		0.754					
Post-Election Audit	Attacks	Insider Attacks	Attacks Against VRDB	ADT-INS-VRDB	0.754	0.700	0.754	0.700	0.754	0.754
Post-Election Audit	Attacks	Insider Attacks	Attacks Against Post-Election Audit	ADT-INS-PADT	0.788	0.788	0.788	0.788	0.788	0.788
Post-Election Audit	Unintentional Disruptions	Error at the LEO	Errors in VRDB	ADT-ERL-VRDB	0.968		0.968		0.968	0.968
Post-Election Audit	Unintentional Disruptions	Error at the LEO	Errors in Post-Election Audit	ADT-ERL-PADT			0.815			
Post-Election Audit	Unintentional Disruptions	Accidental Disruptions	Disruptions by Natural Events	ADT-DIS-NATL			0.307			0.307
Post-Election Audit	Unintentional Disruptions	Accidental Disruptions	Disruptions by Environmental Events	ADT-DIS-NVRO			0.369			0.369
Post-Election Audit	Unintentional Disruptions	Accidental Disruptions	Disruptions by Human-Created Collateral Events	ADT-DIS-HUMN			0.321			0.321

Specific to a remote absentee electronic voting environment