

The Swiss Postal Voting Process and its System and Security Analysis

Christian Killer and Burkhard Stiller

*Department of Informatics IFI,
Communication Systems Group CSG,
University of Zürich UZH
[killer | stiller]@ifi.uzh.ch*



**Universität
Zürich^{UZH}**

Introduction
Remote Postal Voting
Threat and Risk Analysis
Conclusions



Introduction – Advertisement



Eidgenössische Volksinitiative

«Für eine sichere und
vertrauenswürdige
Demokratie»

JETZT
unter-
schreiben



Swiss public initiative on a “Secure and trusted democracy”

Proposed Law

Eidgenössische Volksinitiative «Für eine sichere und vertrauenswürdige Demokratie (E-Voting-Moratorium)»

Art. 197 Ziff. 12[2]

12. Übergangsbestimmung zu Art. 39 Abs. 1^{bis} (Verwendung elektronischer Verfahren zur Stimmabgabe)

¹ Artikel 39 Absatz 1^{bis} tritt mit der Annahme durch Volk und Stände in Kraft; mit der Annahme sind sämtliche Bestimmungen des kantonalen Rechts und des Bundesrechts über elektronische Verfahren zur Stimmabgabe nicht mehr anwendbar.

² Die Bundesversammlung kann das Verbot durch Bundesgesetz aufheben, wenn gewährleistet ist, dass mindestens die gleiche Sicherheit gegen

Manipulationshandlungen wie bei der handschriftlichen Stimmabgabe besteht,
namentlich wenn unter Wahrung des Stimmgeheimnisses:

*... if it is guaranteed that **at least the same security against manipulation exists as in the case of hand-written voting ...***

Comparing “Systems“

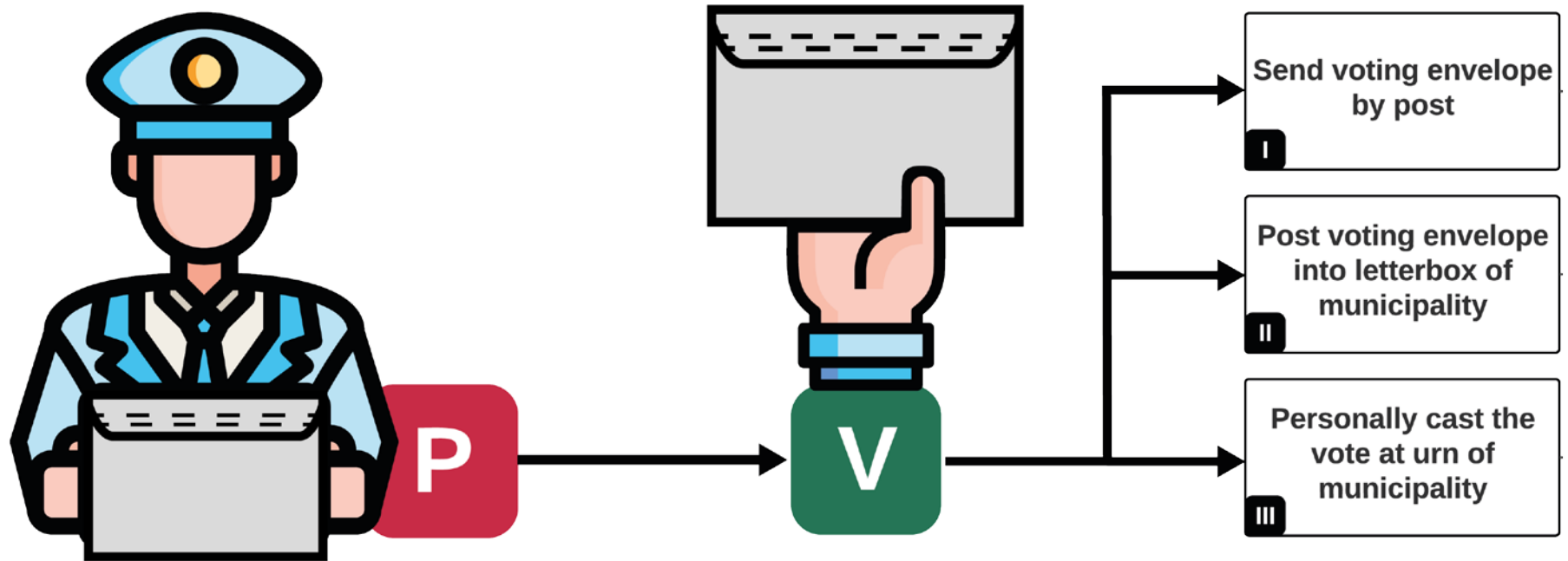
RPV ? REV



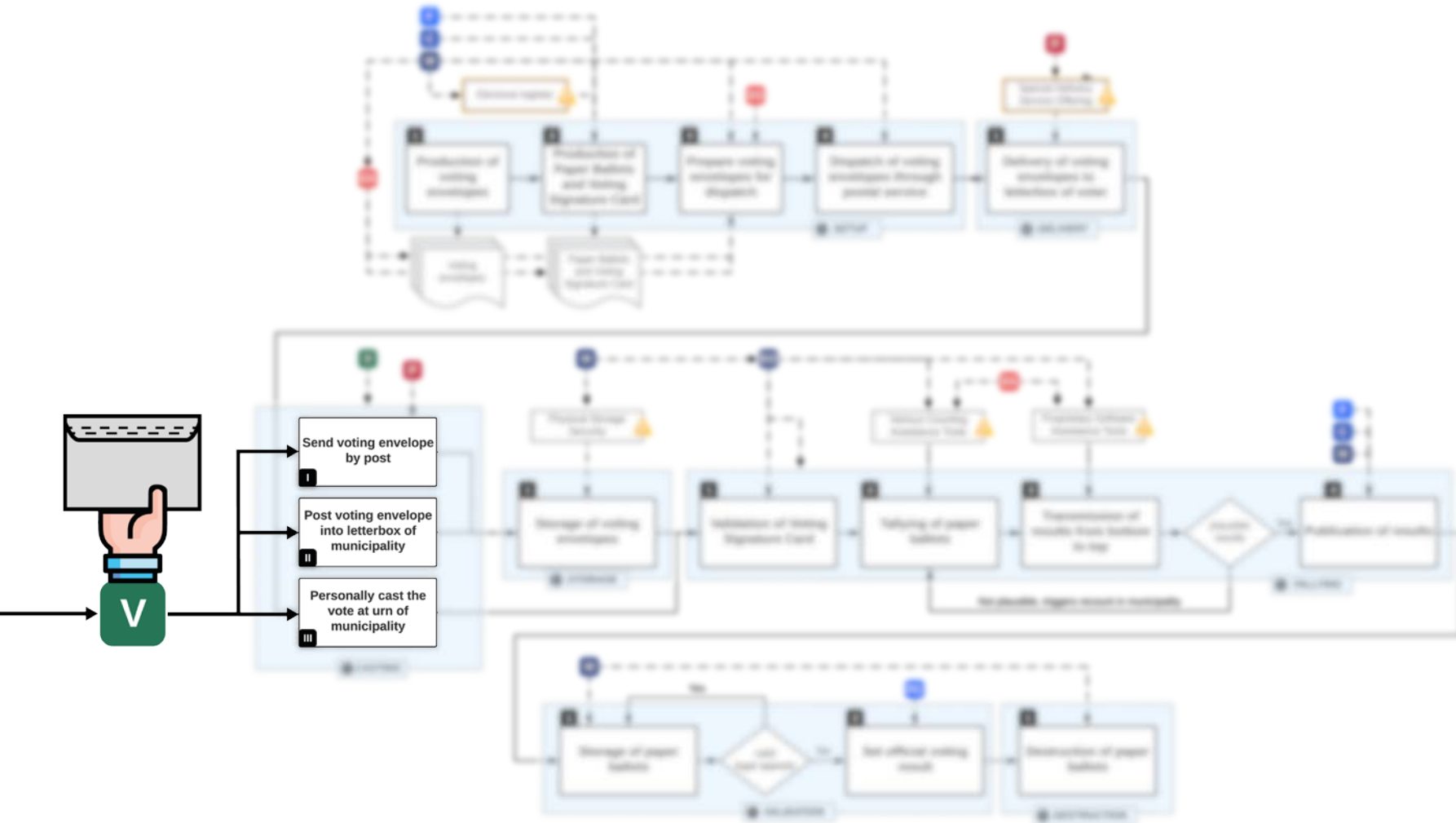
The Swiss RPV Case

- The Swiss RPV is **fragmented and difficult to generalize**, due to federalism in Switzerland, autonomy, and involvement of many external suppliers
- *Goal:*
To identify weaknesses of RPV to allow for “hardening” of the RPV through security and risk assessment.
 - **Disclaimer:** Focus on generalization, may not cover all cantons and processes exactly, leaves room for exceptions.
 - Many exchanges with Swiss authorities and external suppliers

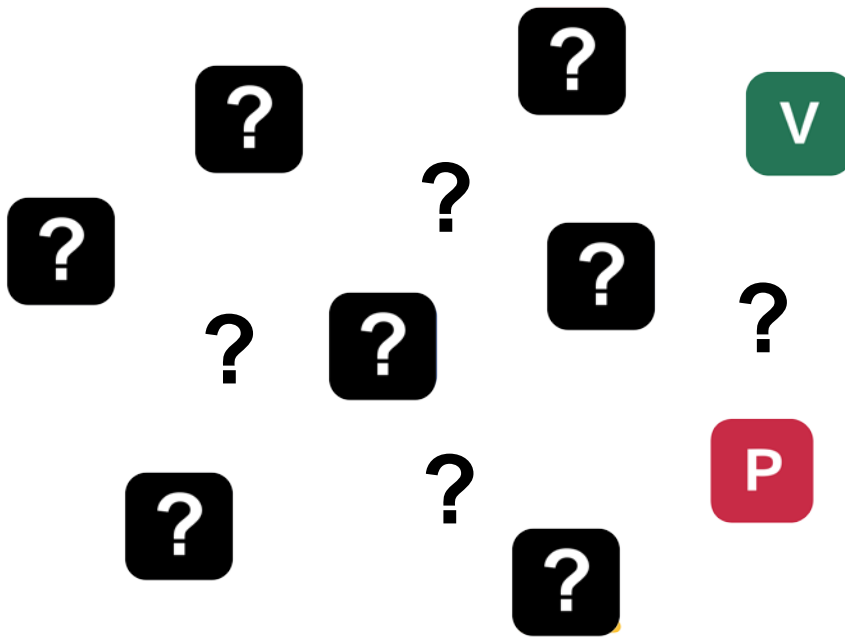
RPV From a Voter's Perspective



PVPF: Postal Voting Process Flow



Identification of Stakeholders

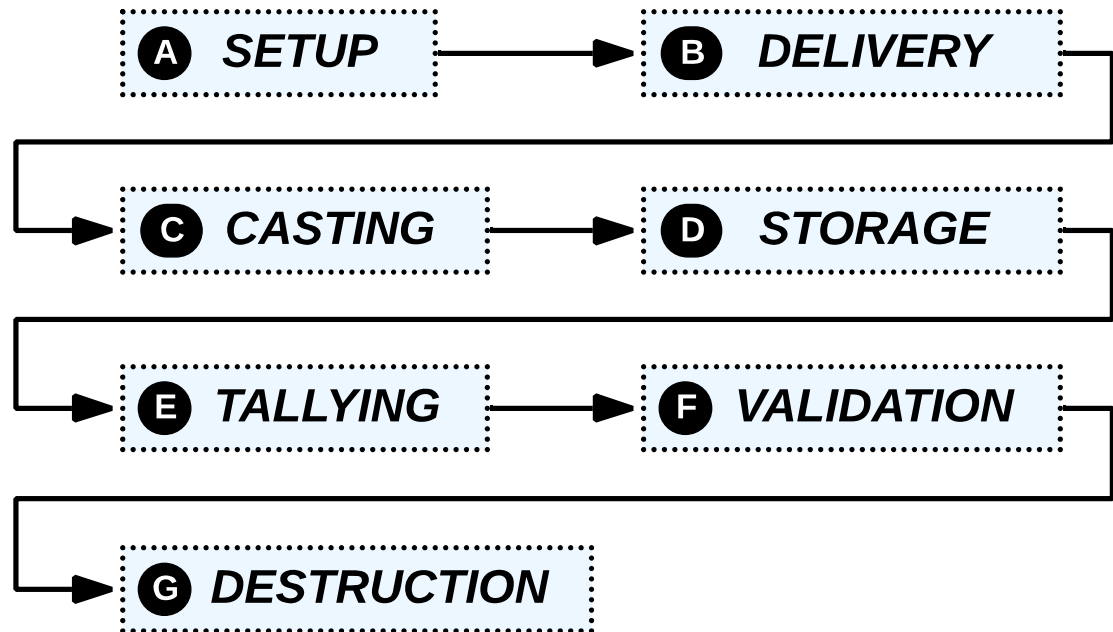


- ? Federal Government
- ? Federal Chancellery
- ? Cantonal Government
- ? Municipality
- ? Municipal Election Office
- ? Eligible Voter
- ? The Swiss Post
- ? External Supplier
- ? Security Threat

PVPF Phases

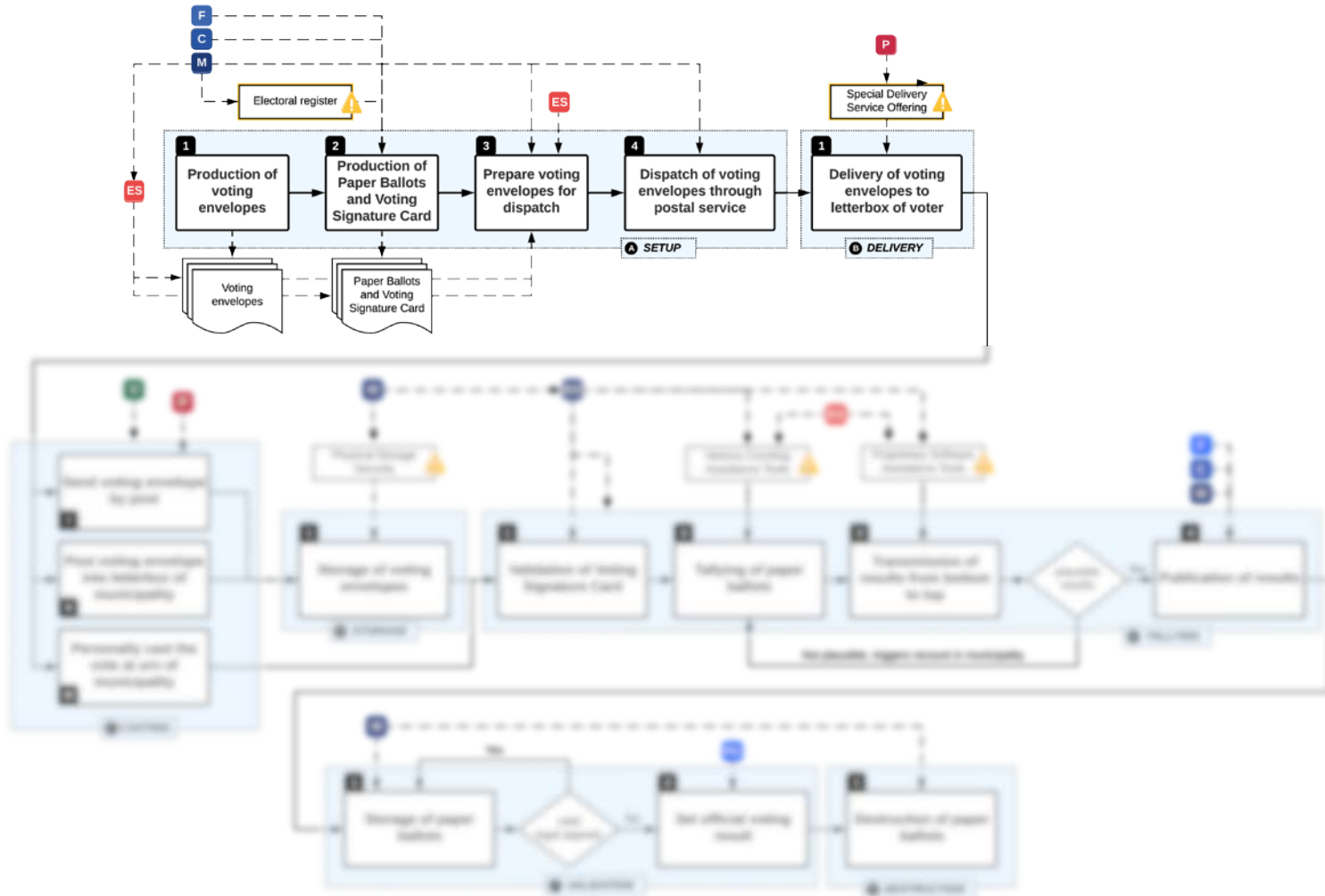
- Divided into phases A to G with various stakeholders

- F** Federal Government
- FC** Federal Chancellery
- C** Cantonal Government
- M** Municipality
- EO** Municipal Election Office
- V** Eligible Voter
- P** The Swiss Post
- ES** External Supplier
- !** Security Threat



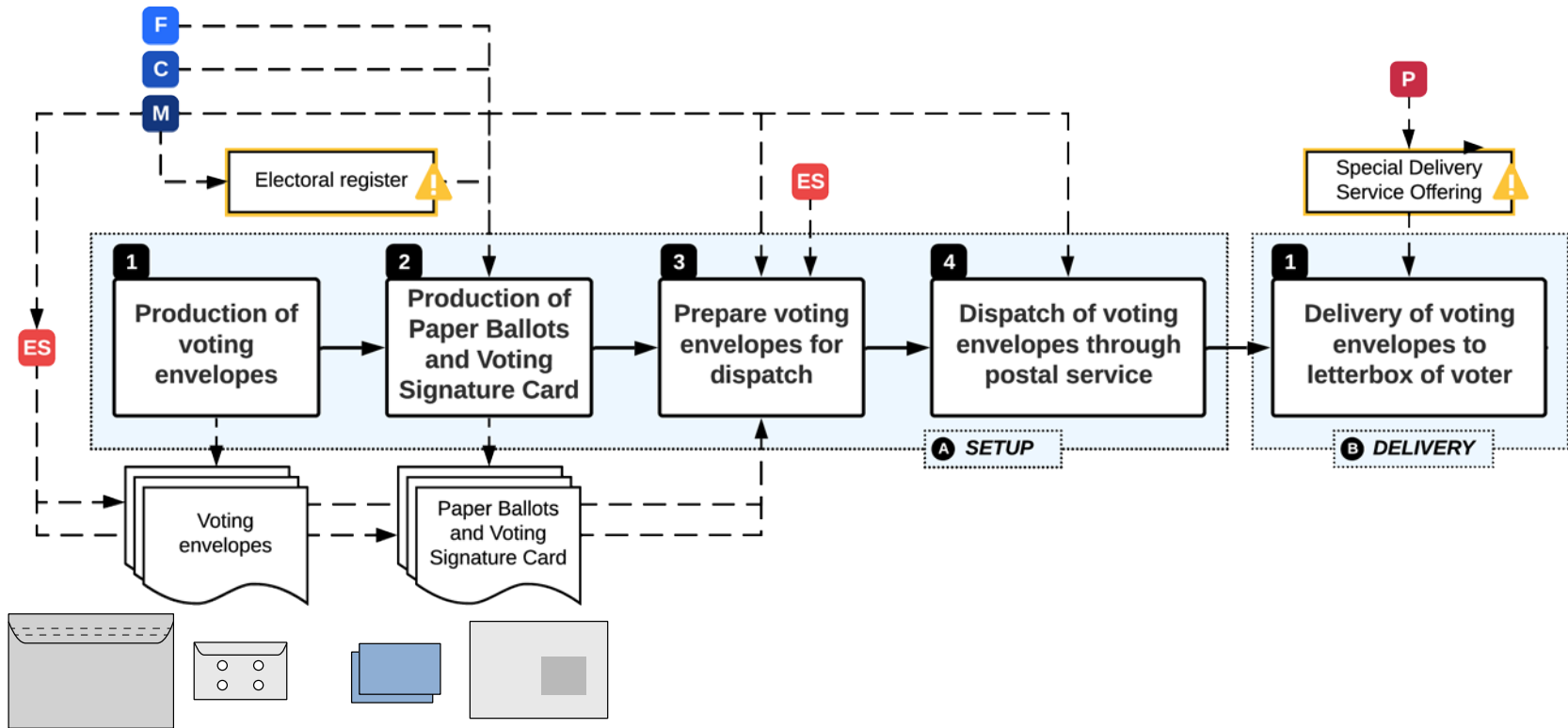
PVPF: Postal Voting Process Flow

PVPF in Detail



PVPF: Postal Voting Process Flow

A: Setup, B: Delivery

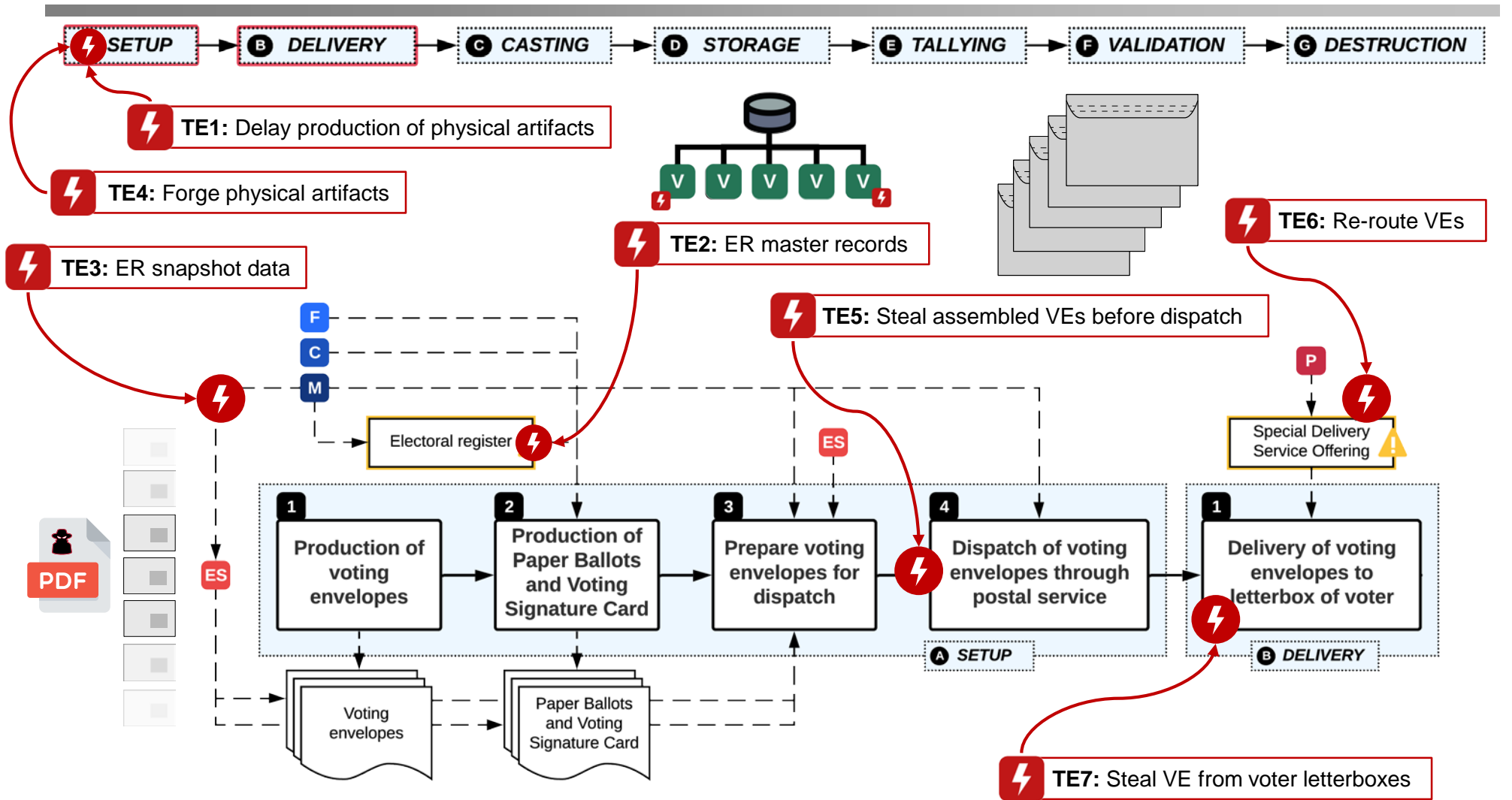


F	Federal Government	C	Cantonal Government	EO	Municipal Election Office	P	The Swiss Post
FC	Federal Chancellery of Switzerland	M	Municipality	V	Eligible Voter	ES	External Supplier
							⚠️ Security Threat

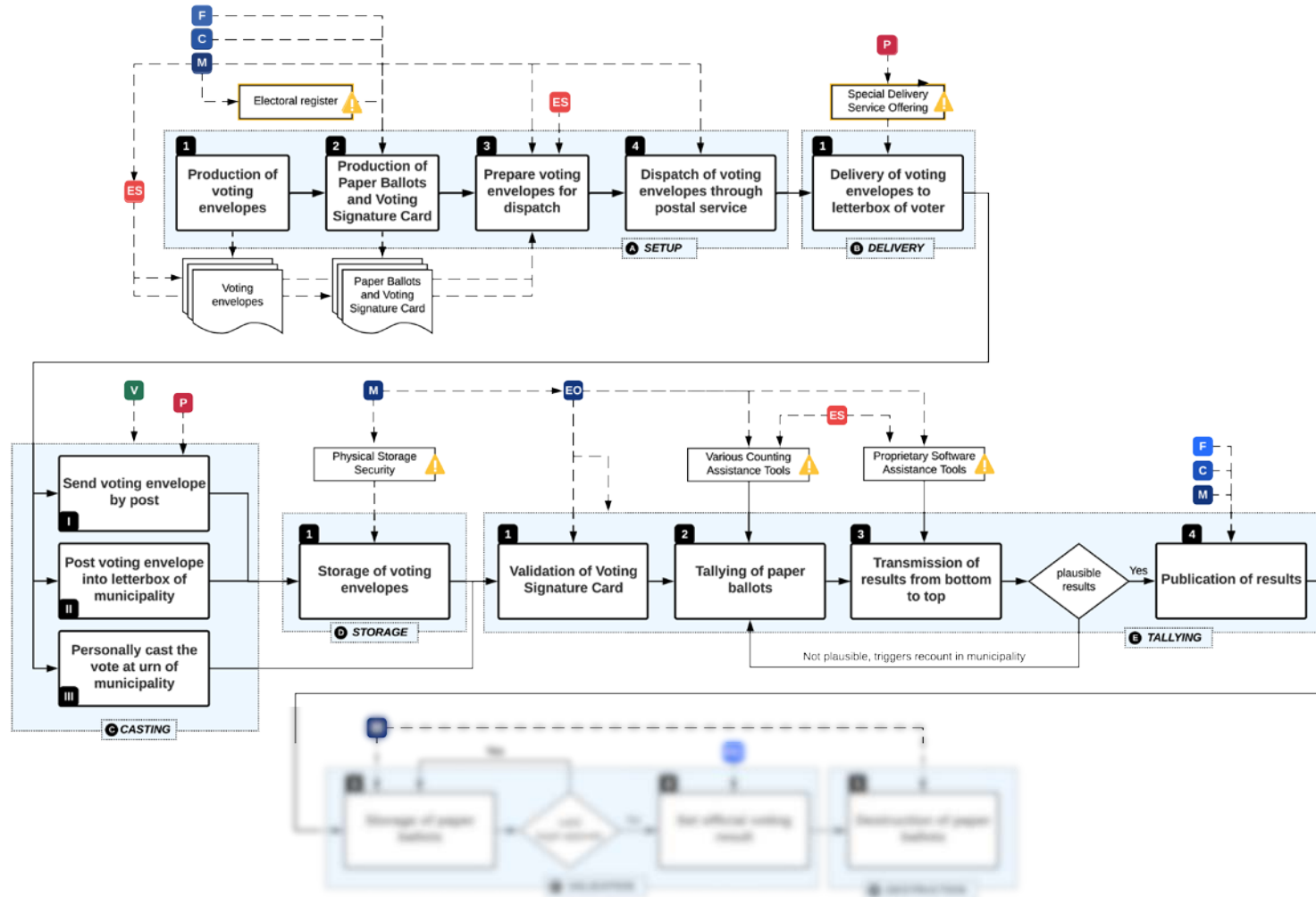
A: Setup, B: Delivery



⚡ THREAT EVENTS

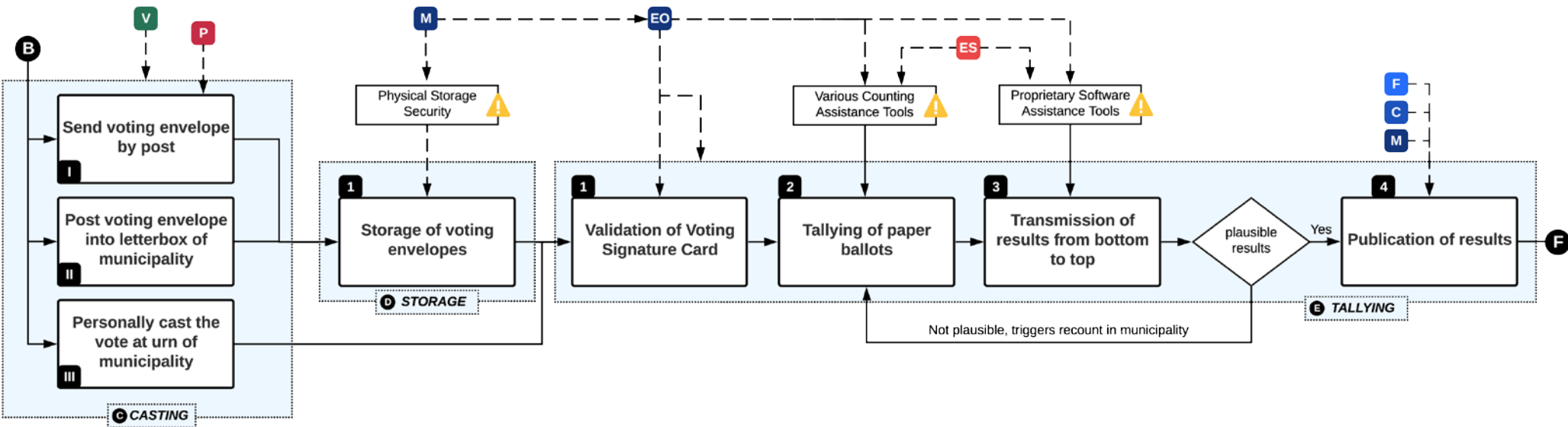


PVPF in Detail



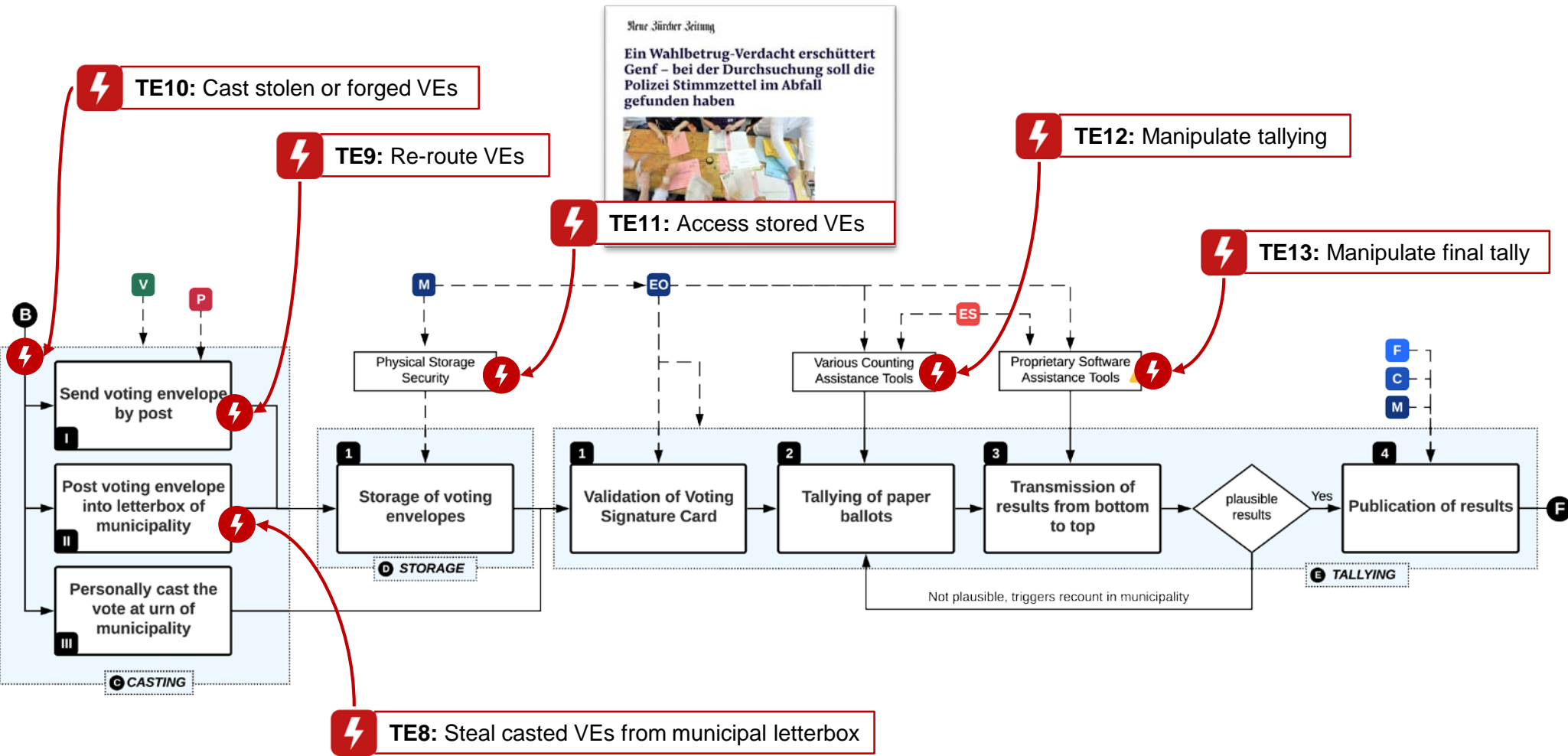
PVPF: Postal Voting Process Flow

C: Casting, D: Storage, E: Tallying

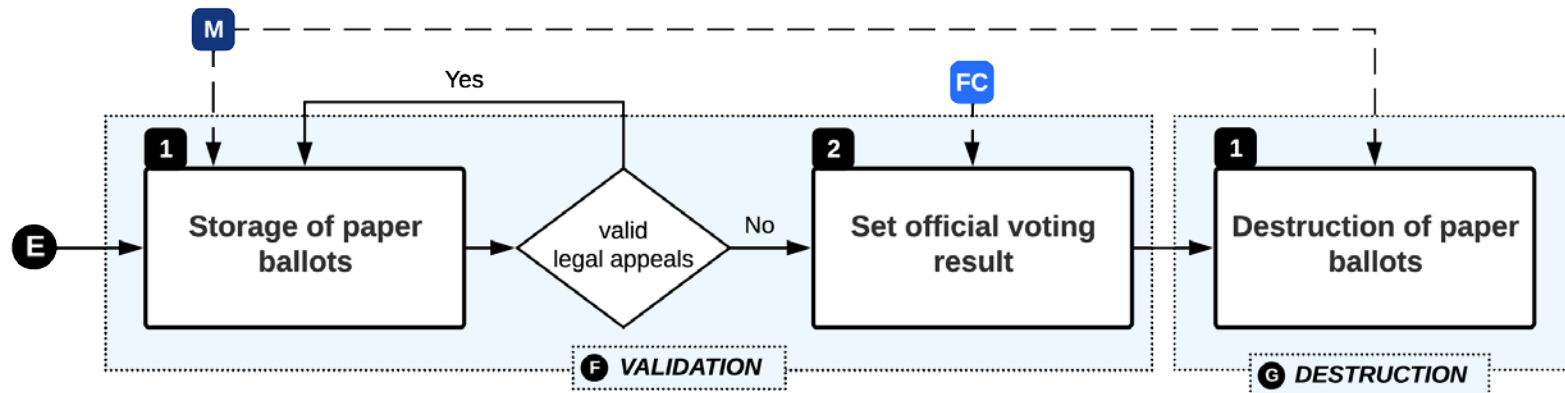


F	Federal Government	C	Cantonal Government	EO	Municipal Election Office	P	The Swiss Post
FC	Federal Chancellery of Switzerland	M	Municipality	V	Eligible Voter	ES	External Supplier
							⚠️ Security Threat

C: Casting, D: Storage, E: Tallying THREAT EVENTS



F: Validation, G: Destruction

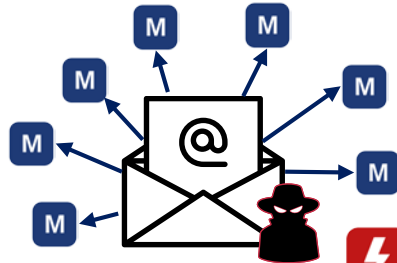


F	Federal Government	C	Cantonal Government	EO	Municipal Election Office	P	The Swiss Post
FC	Federal Chancellery of Switzerland	M	Municipality	V	Eligible Voter	ES	External Supplier
							Security Threat

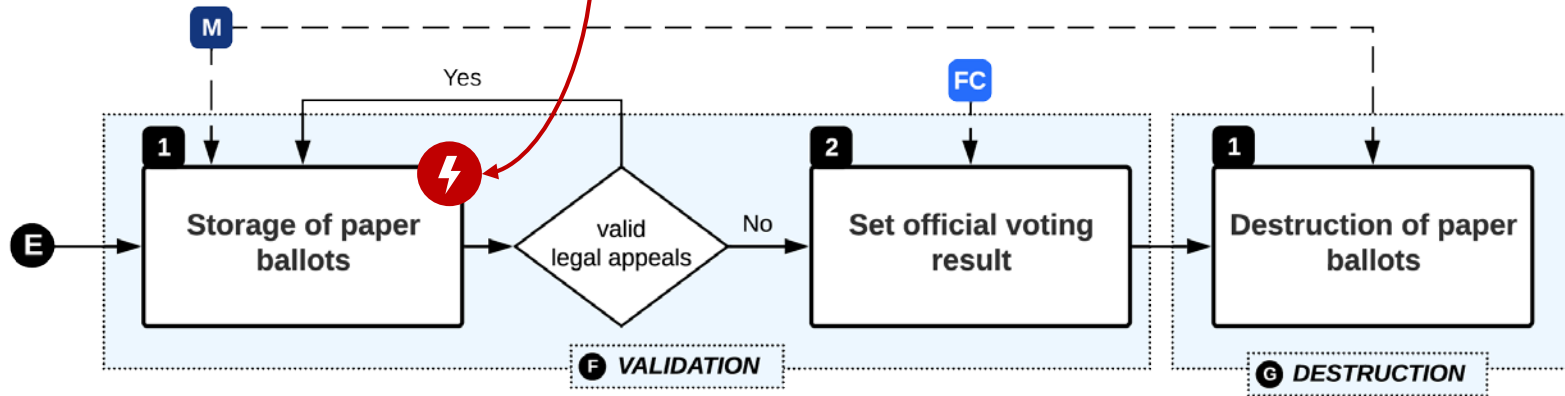
F: Validation, G: Destruction



THREAT EVENTS



TE13: Initiate premature destruction



F	Federal Government	C	Cantonal Government	EO	Municipal Election Office	P	The Swiss Post
FC	Federal Chancellery of Switzerland	M	Municipality	V	Eligible Voter	ES	External Supplier
							⚠ Security Threat

Recalling the Comparison

RPV < REV



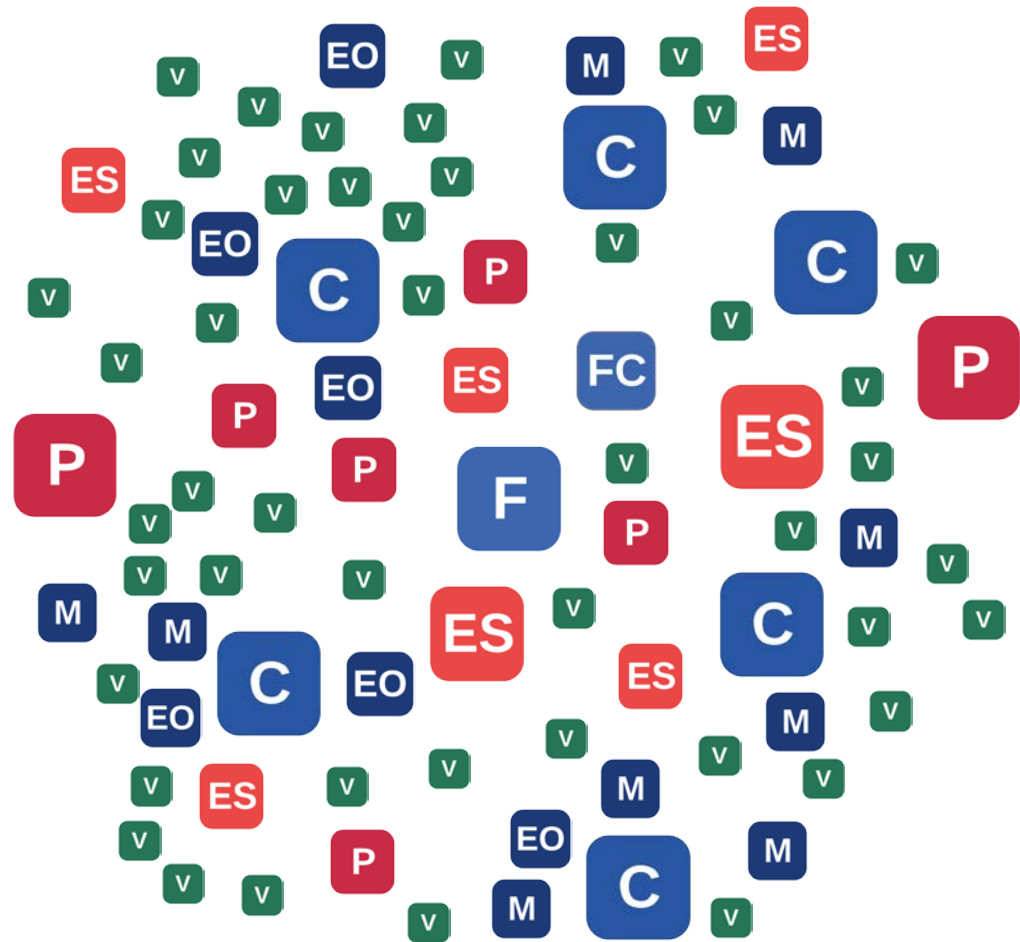
Conclusions

Heterogeneous Processes

Physical Decentralization

Distribution of Trust

Substantial Trust in Third Parties



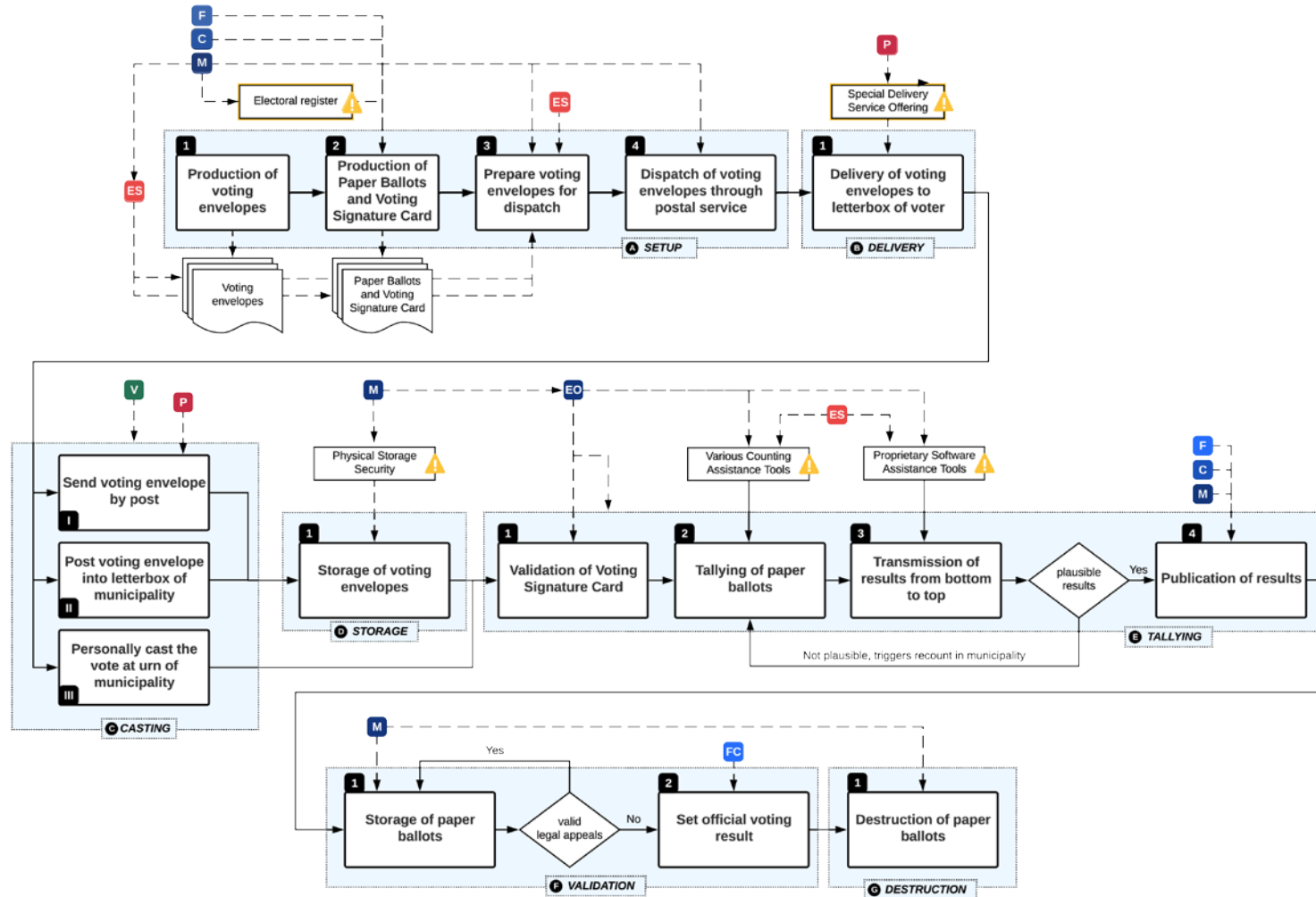
Thank you for your attention.



Many thanks are addressed to Anina Sax, Annina Zimmerli, Dr. Christian Folini, Melchior Limacher, Marco Sandmeier, and Dr. Benedikt van Spyk for their valuable input.

Backup Slide

PVPF in Detail

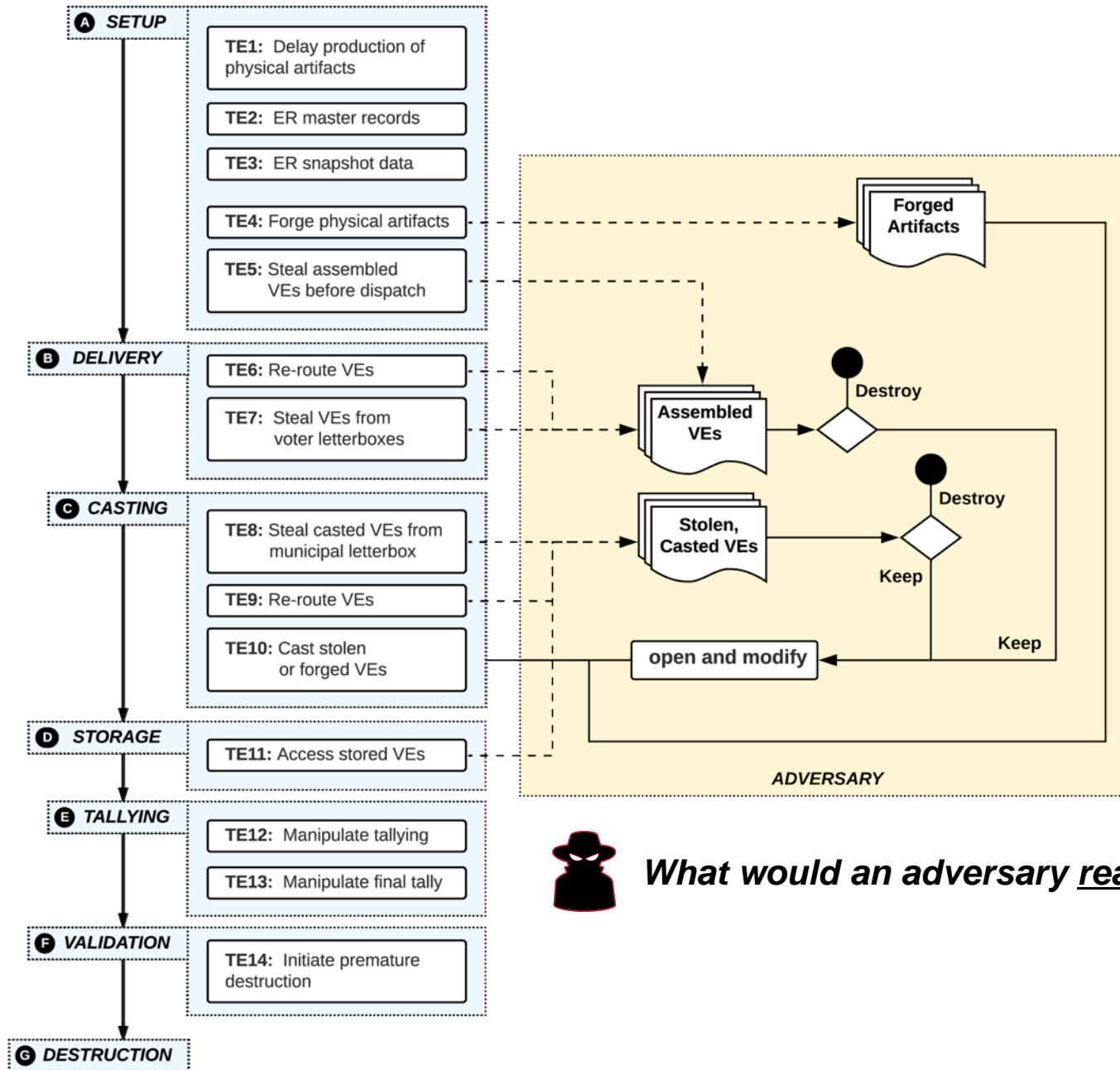


PVPF: Postal Voting Process Flow

Future Work

- ❑ Adapt the PVPF more cantons, which will allow a more granular level and identification of realistic Threat Events
- ❑ Inquiry of deployed proprietary tools is in progress, in active discussions with Suppliers and Authorities

Risk Assessment



What would an adversary really do?