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Lessons from the MH-17 transboundary disaster investigation

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Abstract

Transboundary crises, incidents, and disasters, such as chemical spills, airplane crashes, and critical infrastructure breakdowns, involving multiple levels and domains of governance pose a particular set of challenges (Ansell et al, 2010; Journal of Contingencies and Crisis Management, 18, 195; Boin, 2019; Journal of Contingencies and Crisis Management, 27, 94; Kuipers & Boin, 2015; European civil security governance: Diversity and cooperation in crisis and disaster management, 191, Palgrave Macmillan). These challenges also pertain to the investigation and learning phase of a crisis. We study a typical transboundary case: the crash of a Malaysia Airlines Flight 17 (MH17), with 298 people on board from a variety of nationalities but the majority from the Netherlands, that crashed in Ukraine in a conflict zone near the Russian border. The MH17 case contains valuable lessons on transboundary disaster investigations. The Dutch Safety Board (DSB) took the lead of the international independent investigation into the causes of the crash. With an international group of stakeholders, the DSB investigated a crash that resulted from a bilateral conflict, requiring the support from Ukraine's powerful neighbour Russia that meanwhile stood accused of withholding evidence and supporting Ukrainian separatists. Retrieving evidence and researching the causality of the crash was no easy task. If countries wish to follow their ambition to learn from accidents in order to "prevent the past repeated," they may more often need to investigate such transboundary cases. This case study probes into how challenges that are typical to transboundary crises affected the accident investigation into the MH17 disaster. We search for lessons on transboundary accident investigation that transcend the boundaries of this single case. Such lessons may prove invaluable for learning from future accidents.

1 | INTRODUCTION

On 17 July 2014, a Malaysia Airlines Boeing 777 that had departed a few hours before from Amsterdam airport in the Netherlands was shot down near Donetsk in Ukraine with 298 people on board. None of them survived the crash. The Dutch government soon called for an independent investigation into the causes of the crash. The conditions for such an investigation were highly complex. The circumstances of the crash indicated criminal intent and rumours were that the plane was shot from the sky. The International Civil Aviation Organization (ICAO) stipulates in its Annex 13 that an accident investigation needs to include the country where the crash took place (State of Occurrence), the State of Registry of the aircraft, the State of the Operator of the aircraft (the airline), and the State of the manufacturer of the aircraft.

The Netherlands represented none of these states, but the majority of victims were Dutch citizens. The authorities of Ukraine, where the plane crashed, soon asked the Dutch Safety Board to take the lead in the investigation since the Dutch had established capacity to conduct such an investigation, and the Ukraine government was involved in a violent conflict with Russian separatists. The International Civil Aviation Organization's (ICAO) protocols on

incident investigations permit this assignment of lead responsibility. The crash site was in the midst of the war zone. Retrieving evidence and researching the causes of the crash (in parallel with the investigation into culpability by the prosecution authorities) would be very difficult.

"From time to time, when major aviation related accidents or tragic events take place, the whole world is shaken" (Klenka, 2017:128). The crash was such a worldwide shock because of its implications for global aviation safety; previously taken for granted precautions for deciding on flight routes were suddenly considered inadequate. After years of stable relations with Russia, the new Crimean war came suddenly very close when an airplane full of tourists was suddenly shot from the sky in Europe's backyard (cf. Ter Haar, 2014). An act of war suddenly came closer to home, to people many audiences could identify with. Apart from the shock, the crisis was transboundary in many aspects.

Aviation incidents involving international passenger flights are almost by definition transboundary crises in the sense that they involve multiple national jurisdictions, each with their own rules, regulations, interests, and authority: the crash site, the country of air line registration, the victims' countries. Yet, the MH17 case also involved multiple policy domains (safety investigation, criminal prosecution, international diplomacy and foreign affairs, defence and civil protection, aviation security), at multiple levels of governance: international (such as the United Nations assembly and civil aviation organizations such as ICAO, but also civil protection support from the OSCE—Organization for Security and Cooperation in Europe), supranational (EU commission and its European Aviation Safety Agency), national (all the involved nation states around the globe), and local (such as military groups on the ground not represented by a nation state). The crossing of all these institutional boundaries poses a set of challenges that will be discussed in this article, with a particular focus on their implications for international incident investigations.

Not only the problem and its causes were transboundary, the response and future solutions would transcend multiple boundaries too. "The violent death of so many civilians from different countries over a war zone rendered what was supposed to be a violent act in a local military struggle into a worldwide media spectacle" (Toal & O'Loughlin, 2018:883). The draft United Nations Security Council Resolution of July 2015 categorized the incident as a threat to international security (Lemnitzer, 2017:927). In particular, the MH17 disaster exposed an authority vacuum to deal with this international threat; it made clear that non-state actors can now posses technology such as surface-to-air missiles that are insufficiently covered by arms treaties (Ter Haar, 2014:459; cf. Ölçer, 2017:145). Civil aviation agreements up to that point insufficiently took into account the threat these weapons pose to civilian aircraft because aviation risk management depends on the voluntary reporting of such threats by states in conflict (DSB, 2018).

Another boundary exists between safety and security as separate policy domains and networks in civil aviation (Van Asselt, 2018). The locus of safety regulations and risk assessments can be found in international agreements (international rules and obligations on the operational safety of the aircraft such as personnel licensing and airworthiness), but its focus does not include security threats. Policies and interventions that do focus on aviation security ("safeguarding civil aviation against acts of unlawful interference"—ICAO convention of 1944, annex 17) find their locus mostly in airport and passenger screening (Klenka, 2017:129). Yet, the MH17 incidents show that some security threats do not originate from unlawful acts in the airport or on the plane. Yet while aviation safety regulations focus on unintentional harm, security threats on the ground are insufficiently systematically included in risk assessments by airlines (Klenka, 2017; Van Asselt, 2018; DSB, 2018).

Transboundary crises—affecting multiple systems or jurisdictions simultaneously or in close sequence—typically delegitimize the authority or operations of multiple policy sectors as they have no clear problem owner and invoke confusion on the allocation of responsibility (Ansell, Boin, & Keller, 2010; Boin, 2019; Kuipers & Boin, 2015). Transboundary crises will require an integrated or coordinated response from actors at multiple levels of multiple governments and societies. It also means that accident investigators will have to collaborate more intensively to investigate disasters in a complex web of organizations and interests.

If countries wish to follow their ambition to learn from accidents in order to "prevent the past repeated" in the future, a national or even international focus on accountability and investigation is no longer sufficient. Though international agreements on investigations in aviation have existed since the Paris Convention of 1919, the Havana Convention of 1928, and the Chicago convention of 1944 and the birth of ICAO—a global inter-governmental organization for aviation safety under the wings of the United Nations—in 1947, the MH-17 crisis shows that authority challenges and gaps continue to arise, at multiple governance levels, and that such cases require a transboundary approach, including more than just international cooperation.

To the Dutch safety board, the MH-17 case was unprecedented in scope and complexity. The DSB, created in 2005, is the only accident investigation authority in the Netherlands. In the past five years (2013–2018), it published on average seven investigation reports per year. Its independent accident investigations focus on analysing the causes of large-scale incidents or reoccurring safety risks (range of small incidents). In various sectors of transportation, national and international protocols oblige states to investigate accidents in order to learn how to improve safety. Many states have created sectoral accident investigation bodies, such as for rail or maritime accidents. The Dutch Safety Board concentrates all accident investigation authority in the Netherlands in one single board, with a broad scope and strong legal mandate. Its three crown-appointed members share the final responsibility for all DSB investigations. The organization counts approximately 70 staff members and occasionally hires external expertise for specific investigations.

This case study will probe into the challenges that are typical to transboundary crises and how these challenges affected the incident investigation after the MH17 disaster. With a team of authors

representing both theoretical and practical expertise, we search for lessons on transboundary accident investigation that transcend beyond the boundaries of this single case. Such lessons (both best practices and pitfalls to be avoided in the future) may prove invaluable for learning from future accidents.

The team of authors and researchers consists of three people: (a) a former crown-appointed vice chairman of the Dutch Safety Board (Muller), who was co-leading the international investigation on MH-17; (b) a former senior research manager of the DSB, who was in charge of the coordination and running of the investigation (Verolme); and (c) a scholar with broad expertise on crisis governance who has been studying the case from a scholarly perspective (Kuipers). Two of the three authors were thus participant-observers to the transboundary investigation process. The article does not so much report on the specific findings regarding the MH-17 case, but on the implications for transboundary crises. We aim to learn about transboundary accident investigations by drawing on the in-depth experience with a particular case that in our view exemplifies a transboundary crisis.

2 | TRANSBOUNDARY CRISES IN THEORY

Though transboundary causes and effects of crises abound in practice, a review of three crisis and disaster journals of the past thirty years indicates that transboundary crises and their challenges received only limited attention in the literature (Boin, 2019; Kuipers & Welsh, 2017). A notable exception is the work of Ansell et al. (2010) that outlines the main challenges that transboundary crises pose for the crisis response, followed up by a number of conceptual discussions by Boin (2009, 2019). We here employ the Ansell et al. (2010) framework to take stock of lessons learned in transboundary crisis investigation. The framework will serve to place the lessons learned during the MH17 crisis in the context of these particular challenges.

Transboundary crises often do not pertain to a single event, but "rather a concatenation of related events" (Ansell et al., 2010:197). Those events can often only be related with some kind of precision in hindsight. The fragmentation of causal components implies that transboundary crises often have no epicentre or that the causes are located far from the consequences. Effects are fragmented too: these crises typically escalate in unforeseen directions, exploiting linkages between functional and geographical domains. This is no new trait to crises and disasters (think of the factors and consequences involved in the bubonic Plague, the great Recession or the collapse of the Incan empire). However, "modern vectors such as globalization, optimization of supply chains, increased mobility, tight coupling, and complex interaction of technically advanced systems have increased systemic efficiencies that exacerbate the speed and scope of contagion" (Kuipers & Boin, 2015:193; Turner, 1978; Perrow, 1984). Therefore, familiar hazards (earthquakes, floods, hurricanes) produce unanticipated risks (Boin, 2009). National and functional policy domains are often ill-equipped to deal with transboundary causes and effects in a coordinated fashion.

Transboundary crisis managers face, according to Ansell et al. (2010), typical political-administrative constraints aggravated by the situation's transboundary nature: (a) coping with uncertainty; (b) providing surge capacity (personnel, expertise, resources) and coordinating a response; and (c) communicating with the public (2010:197–200). These constraints are present in any type of crisis, but they are aggravated by interdependence among organizational actors involved in the transboundary variety.

Interdependent linkages between actions and actors can unintendedly affect the collective outcome of the crisis responses. Ansell et al. (2010) instruct us to look at Thomspon's (1967) classic distinction between pooled, sequential, and reciprocal interdependence, because precisely these linkages become more noticeable and problematic in situations where multiple actors and jurisdictions are simultaneously involved. The fact that a crisis affects multiple geographical jurisdictions at the same time implies *pooled interdependence*: a unilateral response to the same crisis is required by multiple actors at once—such as fighting a pandemic worldwide, probably requesting the same resources—such as vaccines—that acutely become scarce. The cross-sectoral nature of the crisis affects actors in different policy domains in often *sequentially interdependent* ways: the response in one domain defines the problem in an adjacent policy domain. The cascading effects of a blackout or cyber crisis come to mind. Most complex is perhaps the *reciprocal interdependence*, which necessitates a joint, coordinated response because each individual actor depends on input from other actors to make a move. The stalemate in European aviation produced by a volcanic ash cloud in 2010, when none of the countries dared to be the first to resume flying in their national airspace and defy the unknown risks and precautionary international "no-fly" rules illustrates this dynamic (Kuipers & Boin, 2015:197).

The next sections show how the sudden interdependencies that arise from the involvement of multiple levels, interests, and domains in transboundary situations complicate each of the regular crisis challenges:

- coping with uncertainty;
- coordination of the response (in this case the investigation);
- and communicating about the crisis.

These interdependencies have specific implications for the accident investigation case explored here. The Lessons Learned section subsequently provides insights from the MH-17 disaster investigation on exactly these implications.

2.1 | Coping with uncertainty in transboundary crises

For disaster investigation, access to information and other sources for forensic evidence is pivotal. Yet, coping with uncertainty

implies that officials depend on information held by other actors. The uncertainty in a transboundary crisis deepens because information is typically not shared among actors across functional domains or jurisdictions (for instance medical actors cannot share information that violates their principles of confidentiality, whereas other organizations may need this information to avoid or mitigate risks in recruiting, staffing, regulating, rehabilitating, etc). It can also be that security-inspired secrecy between states or organizations prevents them from exchanging information the other actor needs. Also different organizations in different policy domains have their own interests, methods, vocabulary, and sets of procedures. This may lead to unintended mismatches and ill-timed exchanges of information that is not properly interpreted or acted upon by other actors.

International agreements on accident investigation emphasize the overriding importance of learning over sanctioning. This is why for instance retrieval of an airplane's black box serves learning purposes above prosecution objectives. Accident investigations thus build on the premise of information disclosure. The transboundary character of incidents and accidents is likely to be a complicating factor in effectively investigating its causes, because the limits of the mandate of the investigator (only for a specified jurisdiction, sector, or professional discipline) meet the multiple perspectives of the key actors involved. This complexity most likely increases with international cases.

2.2 | Coordination challenges in transboundary crises

A second challenge arises from the combined interdependencies in terms of organizational cooperation and coordination. A substantial increase in resources is suddenly necessary to meet the demands to investigate the crisis at hand. In particular, those resources that are expensive to maintain in "peace time," such as specific laboratory facilities or forensic expertise, cannot be shared among nations during crisis because of a simultaneous peak in demand. In the words of Ansell et al: "the ability to plan for resources from elsewhere in a larger network of [...] actors is eroded by the transboundary nature of the crisis" (2010:198).

When interdependence is not pooled but rather sequential or reciprocal, the challenge pertains to the coordination of separate actors and their individual responses to counter a threat or alleviate the consequences. This challenge requires an orchestrated cooperative effort that may even go against the primary individual interests of some or all of the actors involved. For instance, "ownership" or coordination of the crisis response may become an avoided responsibility among the actors involved or—by contrast—a status claimed by different actors (Ansell et al., 2010:199; cf. Kuipers & Welsh, 2017).

Another coordination challenge would be "inter-sectoral coordination"; "although institutions representing different functional domains may not be "sovereign" in the same sense that territorial jurisdictions are, they often differ significantly in their logics and priorities. This problem can become particularly acute among public private entities" (ibid, p. 199). For instance, during the volcanic ash crisis, airlines were desperate to resume flying, whereas manufacturers had no interest in assuming liabilities by providing the little information they had available on how modern aircraft engines would react to ash particles (Hutter and Lloyd-Bostock 2013). Meanwhile, national governments did not have a sound juridical basis for authoritative coordinated decision-making on aviation safety (Alemanno, 2011; O'Regan, 2011).

With any large-scale crisis or accident, different regulators, judicial authorities, forensic investigators, and politically commissioned inquirers may have an interest or obligation to examine the case and its causes. Within a national legal framework difficulties abound to coordinate and align their efforts so that each of these actors can do their job without obstructing the work of others. The challenge for a transnational disaster investigation such as on MH17 are likely to exacerbate with the number of nations involved. Crucial in investigations of transboundary crises is therefore the need for cooperation between different countries with completely different legalities, rules, and laws.

2.3 | Communicating about transboundary crises

Crises can be seen as sudden collapses of a pre-existing social order. Crises in the sense of major accidents and incidents are often potentially foreseeable and avoidable, but at the same time they are characterized as negative surprises with highly disruptive consequences (Boin et al, 2017; Roux-Dufort, 2007; Topper and Lagadec, 2013). Their occurrence provokes a cultural reassessment of precautions regarding risk governance in a specific domain. In Barry Turner's famous words: they mark a "collapse of precautions that had hithero been regarded culturally as adequate" (1976:380). Precautions such as risk assessment practices regarding flying over conflict zones come to mind. One of the most important parts of strategic communication on crises is to provide a "meaning making" account on what is going on (Boin et al 2017). Public leaders need to define a situation in such an authoritative way that it (a) channels emotions and influences citizen behaviour in a desired direction such as "fear and impact management" in response to terrorist attacks (Bakker & De Graaf, 2014); (b) legitimizes proposed actions (Reyes, 2011); or (c) explains how a crisis could occur (in order to restore the legitimacy of the status quo) (Boin, 't Hart, & McConnell, 2009).

Transboundary crises multiply the number of potential alternative causal accounts on a given situation and the number of possibly advocated alternative explanations. Even unilaterally, "getting it [a coherent picture of the situation] out to the public in the form of accurate, clear, and actionable information requires a major public relations effort" (Ansell et al., 2010:200). The increasing number of involved actors from a diversity of domains makes it harder if not impossible to produce one clear and coherent message. The dynamics of transboundary crises in terms of sequential and reciprocal interdependencies result in multiple sources of information at different

points in time that are not always anticipated by all actors involved (ibid, p. 200).

Transboundary aviation disasters, such as the MH17 case, or the disappearance of flight MH370 in 2014, Egyptair flight 990 plummeting into the ocean in 1999, or the explosion of TWA800 in 1996, can give rise to an increase of perspectives and multiplicity of accounts of the case at hand.. Conspiracy stories that arise can complicate the investigation. Competing perspectives do not only bring multiple contradicting sources and multiple biases to the investigation table but also additional challenges in communicating uniformly about the investigation findings. Formal investigation and governmental agencies need to find a way to agree on what to communicate and how to speak authoritatively about the investigation.

The next sections will first outline considerations on methodology and data collection, and subsequently analyse the lessons of investigating the crash of flight MH17 along the lines presented above. The international and interdisciplinary dimensions of this transboundary crisis are likely to exacerbate challenges regarding uncertainty, inter-organizational coordination, and reliable and effective communication.

3 | DATA AND METHODOLOGY

This paper details how the transboundary character of this particular crisis impacted the accident investigation, and how the key actors from the Dutch Safety Board dealt with it. The data for this study are derived from multiple sources. Firstly, participant observation is a primary source of information for this study. The main lessons on MH-17 by the Dutch Safety Board have been gathered by two of its key players within the particular investigation project. Erwin Muller was co-leading the MH17 investigation as one of the three crown-appointed members of the Dutch Safety Board. Ellen Verolme was the responsible senior investigation manager of the Board conducting and coordinating the investigation efforts. Their involvement provided full access and overview of the events and responses as they unfolded. They (co-authors of this article) have consulted colleagues in an interview round before drafting a short list of lessons learned which we subsequently categorized along the lines of the three main challenges. An additional check on exhaustiveness and representativeness of the lessons has been performed by reviewing previous drafts of this account by a different colleague from the DSB. The insights from all persons involved are personal observations and not official standpoints from the authorities involved.

The second source of information is the official, extensive report published by the Dutch Safety Board to account for its investigation and for the steps it took in the process. The complete report has been published both in Dutch and in English and it is publicly available online through the DSB website (DSB, 2015). All claims in this paper have been checked against the content of this official report and wherever possible backed up further with more detail, evidence, and references from the report.

The third source of information consists of secondary sources such as other studies on the MH-17 disaster from a legal perspective (De Hoon, 2017; Kwarteng & Botchway, 2018; Ölçer, 2017; Ter Haar, 2014), an aviation security perspective (Abeyratne, 2014; Klenka, 18
2017; Van Asselt, 2018), or an international relations perspective (Toal & O'Loughlin, 2018). These studies have been used to further test the validity of particular claims or lessons, and to add more detail or insights on particular lessons.

As in other case studies, it is impossible to both have access to the full experience, overview, and details of the event or prolonged situation and meanwhile completely rule out bias towards or interest in the account thereof (cf. Useem et al, 2017). We aim 19
to offer a reasonable set of safeguards notwithstanding, drawing on exceptionally strong and insightful sources, while vigilantly triangulating for validity of claims and self-consciously guarding against bias.

4 | LESSONS LEARNED FROM THE MH17 DISASTER INVESTIGATION

4.1 | Uncertainty on all fronts in a geopolitical setting

The dependence on information provided by others played a major role in the MH17 crisis. Instead of against the backdrop of a government that functions reliably and responsibly, the crash of MH17 took place in a war zone, in the middle of a conflict between two nations (Ukraine and Russia) and a range of rebel groups, with constant shifts between different realities. The crash site was at various points in time in the hands of different parties in a war. Agreements with one group one day would not be valid the next day when another warlord had taken over. For authorities from democratic states, striking agreements with such groups in conflict, or allowing payments even for practical issues such as hiring a truck, is highly questionable if it thereby would imply recognizing the local authority of such a group. The context and framework in which the MH17 investigation took place was changing continuously. When fake news abounded, and verification on the ground was difficult or impossible, potentially new realities waxed and waned continuously. The unstable and insecure context impeded the collection of data in general and the access to the crash site in particular. Not only was the crash site inaccessible to forensic experts, it could also not be sealed off to others.

To the foreign investigators and the governments involved, it was often unclear who was in charge of what, with which representatives appointments could be made and how long these arrangements would be in place. This limited reliability of arrangements, and the constantly changing situation, required interventions on all levels, with all parties, both official and behind the scenes. This made the DSB's work contingent upon cooperation of key players. Consequently, having the facts correct in the investigation was not the only thing that counted, as the support from the right actors was

equally important. For this purpose, the DSB used a special envoy (a former diplomat) to stimulate cooperation on the highest administrative levels. The existing regulation for international aviation investigations had not taken into account such an incident in which the regular forms of accident investigation were not possible. For the DSB, this meant constant improvisation and further interpretation of the existing rules.

During the investigation process, the involvement of so many different actors with competing interest regarding the outcome of the investigation also gave rise to additional uncertainty. The legitimacy of the investigation and the acceptance of the lead role of the Dutch Safety Board was no *fait accompli* beforehand and proved a constant factor to be dealt with. The independence of the accident investigation, and the fact that this was performed by a country other than the country in which the accident took place (the "state of occurrence," in this case Ukraine, is according to international aviation agreements primarily responsible for performing the accident investigation), was continuously questioned. One way of dealing with potential controversy around the investigation was the use of the standard ICAO accident investigation framework prescribed by Annex 13 of the Chicago Agreement. This Annex provides a "cookbook" for air crash investigation that has been developed internationally under the umbrella of the UN. The Annex has subsequently been ratified by all partner nations. By using this standardized approach, questions regarding the approach that was followed during the investigation and aspects such as the thoroughness of the investigation were covered almost "automatically."

In addition, the DSB used its authority based on the Kingdom Act Dutch Safety Board which allows in the Netherlands to request data, cooperation, and access beyond the ICAO mandate. Sometimes it broadened the scope of its investigation (such as to answer questions by relatives to find out about the consequences for the occupants of the plane during the crash) and it would do explicitly so on the basis of the authority provided by the Kingdom Act Dutch Safety Board (DSB, 2015:16–17). Though this Act does not apply internationally, it gave the DSB legitimacy in its requests for additional information and many actors responded positively to such requests. The leading Dutch role in retrieving evidence, remains, and possessions from the crash site was backed by a bilateral agreement between the governments of the Netherlands and Ukraine, ratified on 28 July 2014. The agreement aimed "to facilitate the recovery of remains and the conduct of the investigation called for in United Nations Security Council Resolution 2,166 of 21 July 2014, and other activities as may be agreed between the Parties." (see Agreement between the Kingdom of the Netherlands & Ukraine, 2015, article 1.1; Torenvlied, Giebels, Wessel, Gutteling, & Broekema, 2015: 202).

Yet in spite of legal backing, in the words of one of the DSB members: "Any role ambiguity or even role expansion [of the investigators] could have been detrimental to the whole endeavour. In order to be able to carry out the investigation, we needed common ground among the involved accident investigators from the various countries participating in the investigation, which required that we strictly adhered to the international agreements as well as international and national regulations and that we were able to defend all our choices with references to those frameworks. We also realized that any trespassing would be cast in political terms, so role clarity was also critical in view of our task to carry out an *independent* investigation" (Van Asselt, 2018:594, emphasis in original).

International institutions—actors that themselves represent a multitude of possibly conflicting interests—such as the United Nations followed this investigation closely (Lemnitzer, 2017). The international attention is exceptional for an organization such as the DSB which is a national body that predominantly investigates national issues. The geopolitical dimension increased the importance of this independent investigation. Different countries brought different viewpoints to the investigation table (Toal & O'Loughlin, 2018). The high stakes and multiple perspectives increased the importance to ascertain every bit of evidence in as many ways as possible. The vital importance of ascertaining all evidence three times over stood in stark contrast to the availability of trustworthy and verifiable information.

Therefore, external reviews were also invited as part of the investigation process. The DSB initially conducted a stakeholder analysis on the case to ensure it would be aware of different interests and perspectives during the investigation. Reflection meetings were organized, for which the DSB invited external experts to advise and review the investigation process so far and its preliminary findings. The meetings explicitly aimed to explore how the DSB could ensure that its investigation would match the expectations of the outside world (DSB, 2015:18).

4.2 | Transboundary coordination

Providing surge capacity was a prominent issue from the start for the DSB, as the MH17 investigation weighed so heavily on the DSB's internally available resources to collect and analyse information. Approximately 72 members of the DSB staff were at some point involved in the activities in support of this single investigation (DSB, 2015:22). This number exceeds the total number of staff members that normally works for the DSB on multiple investigations simultaneously. Only a handful employees worked on other investigation projects, most of which were postponed. In a "normal" year, the DSB conducts five to six investigations simultaneously, and after the summer of 2014 the organization focused on only one all-consuming project. The investigation also demanded an unprecedented procurement and coordination of external expertise. The number of external experts that were contracted by the DSB eventually doubled and then even nearly tripled the organization in size, at the peak of its activities. One of the DSB staff members described the situation as similar to an organizational "infarct."

Coordinating activities to get the job done on the scene was another issue. One of the most pressing problems from the very onset of the investigation was access to the crash site to retrieve bodies, materials, and forensic evidence. Operating in a war zone is clearly outside the comfort zone of accident investigators. The conflict

evolved rapidly in the weeks before and after the incident and attempts to arrange a ceasefire to perform (forensic) investigation at the crime scene proved to be very difficult. The priorities of the Dutch government to recover the bodies of the victims as soon as possible implied that other investigative activities such as the recovery of debris and investigations into the probable cause on the crash site had to be postponed to a later stage.[1] This was an important setback to the investigation, which is usually largely dependent on the collection of onsite materials. It meant that investigative activities such as the analysis of digital evidence played a relatively more important role than in other investigations. During the investigation, it turned out that for instance pictures taken on site by Ukrainian and Malaysian investigators immediately after the crash proved to be invaluable in the months thereafter. When the accident site was temporarily inaccessible, reconstruction, and verification of aircraft parts depended heavily on these initial photographs to continue the progress of the investigation.

Concentration with the criminal investigation plays a role in almost any accident investigation case. In the Netherlands, legislation clearly demarcates the responsibilities and mandate of the DSB vis-à-vis the work of the prosecution office. The Dutch law on the DSB includes explicit provisions that "give the DSB excessive authority to request data and information that it needs for its investigations, or to request that parties cooperate with the investigation. Statements made to the DSB may not be used as evidence in legal processes. With this provision, the legislator aims to encourage the persons involved to provide full disclosure, since they do not have to fear (criminal) legal percussions" (DSB, October 2015:14–15). In the international context of the MH17 investigation, these rules of conduct were not self-evident (cf. Van Asselt, 2018). The Netherlands had also taken up the responsibility for leading (through the Dutch Public Prosecution Service) the international criminal investigation by the Joint Investigation Team. The DSB often works side by side with the Dutch Public Prosecution Office domestically. For the MH17 investigations, they agreed to elaborate the existing protocol in place to align their investigating activities. In this protocol, they agreed to each proactively share information the other organization might need for its investigation as long as sharing this was not detrimental to its own investigation (DSB, 2015:63).

It was clear that the MH17 *accident* investigation could only take place when the independence and bias-free nature of the investigation would be respected. Otherwise, the results of the investigation would probably not be accepted by the parties involved. Meanwhile, the call for *criminal* prosecution and punishment of the perpetrators became louder in the domestic media and among national authorities. Already on the day after the crash, *Deutsche Welle* reported that the investigative journalism collective Bellingcat had found indications of the plane being shot down with a surface-to-air missile (DW, July 18, 2014). Questions on guilt and prosecution were publicly put squarely on the table from day 1. This demonstrated the importance of continuous attention on the differences between both investigations, on information exchange between accident investigation and prosecution, on deciding which pieces of information could be shared and which information should be kept for the accident investigation only.

Coordination of an international investigation including partners from different countries is completely different from the coordinative activities that DSB performs in a domestic accident investigation. In the case of MH17, the team consisted of the Netherlands, Ukraine, Malaysia, the UK, the United States, Australia, and the Russian Federation (DSB, 2015:15). Such participating investigators may have different mandates and there is no hierarchy in place to rule the network. Ukraine had soon after the crash requested the DSB to lead in the Investigation, which also may have been influenced by the fact that the Ukrainian investigators had only two months earlier made a bilateral working visit to the Netherlands to exchange best practices. The Dutch Safety Board has a special concentration of investigative authority in one single body and a strong national legal mandate that equipped it—and perhaps legitimized it to others—for complex and sizeable investigations.

A practical way to deal with tension between national interests in the context of an investigation is the so-called party system with accredited representatives of each nation involved in an investigation, a common practice in international air crash investigations. The inclusion of the Russian Federation in this party system which meant that they had to go along in creating the consensus that was needed in each step of the investigation. Some steps of this party-system approach were followed explicitly during the MH17 investigation as well, for example various international meetings when a new phase of the investigation was reached and consensus had to be reached about the conclusions thus far.

4.3 | Communication with the world

The crucial importance of uniformity of communication stood in stark contrast to the challenges that the DSB faced in communicating about the MH17 investigation. As the MH17 crash was part of a larger conflict between a number of parties in Ukraine, multiple accounts of what happened existed and regular war propaganda played an important role in the worldwide communication flow about the incident. The DSB had to weigh every piece of information that became available extremely carefully on its trustworthiness, source, and importance to the investigation. This was not only the case in the early phases of the analysis, when data were collected, but also in later stages, when local sources for instance denied that the BUK weapon system was proliferated in the region.

Meanwhile, the chairman of the Dutch Safety Board demanded a limited time span for the investigation, announcing the publication deadline of 13 October 2015, early on. A firm conviction that timeliness was also part of the quality of the investigation, that relatives of the passengers were entitled to the soonest possible conclusions, and that during the investigation, the DSB would be the only voice

that could communicate authoritatively about the case, contributed to this tight schedule.

The relatives of victims played an important role in the considerations of the DSB throughout the investigation process. When the DSB reported on its findings, it not only published a report to account for the investigation process, but also a special book written by journalist in accessible language on the investigation and its findings. Relatives of victims were also informed prior to public announcements and press statements. The central position of victims and relatives in investigations is a relatively new trend that stands in stark contrast with the information position of the affected in previous decades (Jong & Dückers, 2019).

The communication approach of the investigation to conflicting views was an inclusive one. In the early phases of the investigation, an international social media analysis commissioned to a third party resulted in a list of wide-ranging hypotheses that were all systematically considered in the investigation process. The aircraft was meticulously reconstructed from the debris and the parts that could be recovered.[2] This is an arduous process but it proved crucial in showing and communicating the findings of the investigation to stakeholders, victim's relatives, and the public at large. The evidence was there, for the whole world to see. Several meetings with the accredited representatives of the nations involved in the accident investigation ensured that these national authorities could voice potential disagreement and alternative views within the confines of the investigative process. Each meeting was concluded with the results of the investigation so far. Deviating views were noted and responded to in the report. In the end, less far-reaching joint conclusions that included all partners on the findings were also formulated. When the final investigation findings were presented, most alternative accounts had already been discredited along the way.

Not only multiple realities co-existed, also new sources gained prominence in influencing public perception. The MH17 investigation was probably the first in which private investigation initiatives such as the Bellingcat collective played such a visible role. Due to the large amount of information that such research groups were able to discover and because of the public access to their efforts, the communis opinio quickly focused on one scenario in particular. The DSB realized it should be constantly aware of the possible influence this may have on investigators and to be alert on confirmation bias and other effects on the objectivity of the investigation. The DSB also had to account constantly for the long duration and arduous nature of its investigation, towards an audience that seemed to have made up its mind long time before. With a "power shift to the previously uninformed," a new set of actors had to be taken into account (Cf. Florini & Dehqanzada, 1999:46).

To convey a strong unambiguous message about the findings and conclusions of the investigation, the reconstructed aircraft formed the background of the press conference in which the chairman of the DSB presented the findings of the investigation. The pattern of holes in the plane was there for the whole world to see. The precise account of the facts found in the investigation matched the visible evidence in the background. The visualization of evidence may have contributed to overcoming transboundary communication challenges that otherwise relate to language and contradictory sources.

5 | CONCLUSIONS: TRANSBOUNDARY ACCIDENT INVESTIGATIONS

In sum, this case yields many important lessons regarding international accident investigation in response to transboundary crises. First, uncertainty reduction required diplomacy at the highest levels of international governance, the legitimacy of the investigation benefitted from clear pre-existing procedures and strong mandates, and external reviews were deliberately invited as part of the investigation. However, this does not alter the fact that within these investigations uncertainty will remain a key issue. Even if facilitated by high-end diplomacy, clear procedures and external reviews, investigations in a transboundary context will require constant improvisation. Citizen journalism and investigation efforts proved to be informative to many in terms of uncertainty reduction but also a serious challenge to formal investigators. Finally, the DSB aimed to reduce public uncertainty and to find answers for the relatives of the victims by establishing a firm deadline early on. This is a form of uncertainty reduction for others that is invaluable, but it increased stress on the investigators.

Second, the coordination challenges that arose in terms of providing organizational capacity and cooperating at multiple levels of governance were manifold. The size and scope of the investigation demanded an unparalleled effort on the part of the DSB, and unprecedented cooperation with and reliance on external partners and sources. For instance, investigating in a war zone implied that much of the initial evidence relied heavily on digital photography from those who reached the scene when it was still accessible. Initial reliance on photographs taken by forensic teams at the crash site—because the site was later on also temporarily inaccessible and could not be sealed off—was new for investigators and proved how invaluable the first documentation was. The parallel investigation by the prosecution team made strict agreements on independence and information sharing imperative. The party system of accredited representatives played an important role in creating international consensus during the investigation process. All three observations indicate the importance of building trust in an international network from the very start of the investigation, and the implications of sound processes of information sharing and decision-making and carefully crafted agreements between partners from different functional and geographic jurisdictions. Investigative authority, in spite of the international agreements in civil aviation, cannot be seen as a given but needs to be constantly established and earned, in the process. More could be learned from research on organizational reputation of regulators and authorities, also for coordination in crises situations (Carpenter, 2010; Busuioc, 2016).

Third, communication in terms of meaning making and providing an authoritative account of the causes and lessons of the MH17 disaster proved to be a compound challenge. The investigators included all competing hypotheses in their research, meeting Elliott and McGuiness (2002:21) plea for a broadening of scope of investigations as "in matters of public importance, all relevant evidence should be considered." The inclusive approach served a communication purpose as well; considering all possible explanations for the crash exhaustively and transparently, the investigation firmly established its conclusions and presented them to the world. The DSB further showed awareness of potential public distrust by offering transparency on the investigation process in the form of a special report. The investigators also reached out to the relatives of victims, in order to include them prominently in their communication efforts, as evidenced by their special publication in accessible language on the investigation process and findings (Smilde, 2015).

We argue that these lessons transcend the boundaries of this individual case. With the increase of international civil aviation of the past decades, the increase of extreme weather and climate change-related disasters, and the interconnectedness of critical infrastructures and common markets, transboundary crises are likely to be on the rise. Lessons on transboundary accident investigations are no luxury. Accident investigators should prepare for intense multi-level, multi-sectoral cooperation in line with the challenges and coping efforts outlined above. Transboundary lessons may prove invaluable for learning from future accidents.

ENDNOTES

[1]Visit the website of one of the Dutch national tv news media, for the press statement of July 18, 2014, at https://nos.nl/video/676578-persconferentie-premier-rutte-en-minister-timmermans-over-vlucht-mh17-16-00-uur.html (retrieved on 10 October 2018).

[2]This is done only in rare occasions, and such a reconstruction had never before occurred in the Netherlands. The DSB studied two famous prior reconstructions: the TWA flight 800 in the United States and the Pan Am flight 103 in Scotland in order to learn from previous experience.

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