Technical Recommendations To Improve the EU IUU Regulation Catch Certificate System

Final Report

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Submitted by

MRAG

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Acronyms

BIP	Border Inspection Point
BOVEX	Bovine passport Exchange
BTSF	(EU) Better Training for Safer Food
CA	Competent Authority
CC	Catch Certificate
CCA	Central Competent Authority
CMM	Conservation and Management Measures
CN	Combined Nomenclature
CNSP	National Fisheries Monitoring Centre (France)
CVED	Common Veterinary Entry Document
DG PEMAC	Ministry of Agriculture, Food and Forestry – Directorate General of Maritime Fisheries and Aquaculture (Italy)
DG's	Directorate Generale (European Commission)
EFCA	European Fisheries Control Agency
EFTA	European Free Trade Association
EO	Economic Operator
ETA	Estimated Time of Arrival
EU	European Union
IUU	Illegal Unreported Unregulated fishing
LCA	Local Competent Authority
LVU	Local Veterinary Unit
MCS	Monitoring, Control and Surveillance
MMO	Marine Management Organisation (UK)
MS	Member State
NGO	Non-Governmental Organisation
NVWA	Food and Consumer Product Safety Authority (Netherlands)
OCR	Optical character recognition
RASFF	Rapid Alert System for Food and Feed
SLO	Single Liaison Officer
TRACES	TRAde Control and Expert System
WCO	World Customs Organisation
WWF	Worldwide Fund for Nature (World Wildlife Fund in US)

1 Introduction

This report was commissioned by WWF to support the work carried out in coalition with its partners (Environmental Justice Foundation, Oceana, and The Pew Charitable) to secure the harmonised and effective implementation of the European Union (EU) Regulation to end illegal, unreported and unregulated (IUU) fishing.

WWF noted that a key objective of the coalition is to improve the effectiveness of the EU IUU Regulation´s catch certificate system in identifying and blocking illegal seafood products (from entry into the EU). This report addresses the European Commission's plans for the modernisation of the catch certificate system and examines these in relation to the coalition's own goals for the improvement of the catch certificate process. This will include an examination of the "gaps and shortcomings" of the Commission's proposal, and possible approaches for meeting these gaps.

This report addresses some of the technical aspects of that objective as described below:

- An overview of the TRACES system and its functionalities (see Section 4).
- A critical analysis of the TRACES system's ability to incorporate the technical and operational needs of the catch certificate system (see Section 5)
- A summary of recommendations (see Section 6).

The general approach taken throughout this study can be found in Section 2 (Methodology).

The views and recommendations expressed in this report are exclusively those of MRAG.

2 Methodology

The general methodology to this study consists of four broad approaches. Firstly, a summary of current CC practices and a model of the existing CC system will be achieved via questionnaire feedback and assessment of the MS biannual reports (and how this is implemented in Member States). This will allow us to identify and highlight its strengths and weaknesses.

Secondly, an analysis of the TRACES system will be produced based on expert knowledge and the experience of its users, with an emphasis placed on the functionality in the TRACES system that would be most applicable to a CC system.

Thirdly, a catalogue of requirements for an EU wide catch certificates system will be generated. Included in each requirements will be a SWOT analysis (Strengths Weakness Opportunities Threats). The SWOT analysis and the analysis of TRACES will be combined to extend the requirements catalogue, to show what the technical and operational issues will be for a system based on TRACES that will meet the requirements of a catch certificate system for the EU.

Finally for each requirements a recommended solution is suggested as to how an EU catch certificate system based on TRACES could be implemented. Where significant gaps remain these are also highlighted.

3 Questionnaire

Primary data regarding the overview and potential improvements of the current CC system are collected via the dissemination and completion of a self-administered questionnaire. Three broad stakeholder groups were approached, representing different interaction points with the CC system; EU MS Competent Authorities (Verification), importers/ exporters (Generation) and selected third countries (Validation).

As each stakeholder group interacts with the current system in a different manner, and thus will have different requirements, a subset of relevant questions was submitted to each group. Any recipient of the initial questionnaire that responded confirming they had experience of the TRACES system, and identified customs officers, were sent a separate follow-up questionnaire that collected information regarding the implementation of TRACES and its capacity to support a reformed CC system.

All emails to identified stakeholders were sent with delivery and read receipts in order to monitor their acceptance, and data subsequently recorded in the contact log. All recipients that initially responded positively but did not submit a completed questionnaire were approached with follow-up emails.

3.1 Contact log

Between the dates of 22nd September 2015 and 27th January 2016, 359 questionnaires were disseminated, of which 64 were not read or the recipient had left their role, leaving a total of 295 questionnaires successfully delivered; 44 follow up emails were sent to those who responded positively. In total we received 15 completed questionnaires, 7 relating to Catch Certificates and 8 relating to TRACES, from Member State Competent Authorities and an additional completed questionnaire from the NGO coalition. A breakdown of questionnaire responses, sent and read emails, can be seen in the table below (Table 1).

A complete logbook of email correspondences, and questionnaire responses can be made available on request.

Table 1. Breakdown of sent emails, read emails and responses.

	MS Competent Authorities	Exporters and Importers	3rd Countries	Commission	TRACES	Total
Sent emails	63	21	18	1	192	295
Read emails	28	21	13	1	65	128
Questionnaires completed	7	0	0	0	8	15

3.2 Questionnaire response overview

We received seven completed questionnaires from Member State Competent Authorities regarding CC, and we have also received the views of the NGO coalition. The limited number of responses collated precludes any in-depth analyses of the stakeholders' interactions, difficulties and requirements. Therefore, for the purpose of this report, we supply a qualitative overview of the narrative of responses. To the extent possible, we aim to highlight recurring themes and similarities and differences between MS.

Greatest concerns raised were regarding the duplication of CC (and the inferred risk of duplicated imports of IUU catch), the difficulties of complex supply chains and the opportunity for confusion relating to CC and the transhipment of products, especially when

products are entering the EU via a MS that is not the final destination (market) for the product. Further, the collation of data and information to verify the CC was highlighted to be a complicated procedure.

The recurring view is that the number of different systems currently implemented by MS (which are different in all MS) creates an imbalance across the EU, both in terms of capacity and capability to restrict the flow of IUU products into the EU. It allows products to be introduced into the EU market through numerous corridors, each with different risk analyses and verifying systems. This multifaceted approach precludes accurate and reliable coordination between MS and results in the monitoring of IUU on a single nation-basis. These concerns are corroborated by the replies of all MS. They record no problems with communication within countries, but report significant issues with communication between countries, especially third countries which sometimes fail to provide sufficient information to verify a CC.

All responses welcomed the creation of a centralised EU CC system. There was a general consensus that it would enable ‘better control of balance’; would help close ‘loopholes’ such as split consignments and the duplication of CCs. Furthermore, a centralised system is welcomed as it would facilitate the standardisation of the approaches that MS are able to use to implement risk analysis and verification and would help prevent importers accessing the EU via the ‘easiest possible route’.

However, respondents also added that any new system must be ‘user-friendly’, in order to ensure timeliness of CC processing and to avoid increased effort beyond the current system.

Additional information that, in the opinion of the MS, would improve a new centralised system, includes:

- Data on intermediate transport and importers;
- More detailed information regarding the catch area, such as the coastal state of the RFMO’s;
- Disaggregated data representing the actual weight of fish being imported, this is due to the fact that a CC does not often reflect the product being imported just the total relating to the CC; and
- The name of the fishing vessel, is important, but should be treated with the greatest sensitivity in any new system.
- Provide a risk assessment tool or framework

Only two MS provided views on information deemed unnecessary for a new system:

- Information of the vessels home port and skipper, as it is not essential for the verification of the CC;
- The signature of the vessels captain is seen as superfluous.

Recurring themes from the Questionnaire responses include:

- A new system must prevent the overuse and duplication of CC;
- A central database of CC numbers is urgently required, to prevent falsification of CC;
- It should make spatial information easier to collect, and automatically cross-reference with specific closed areas, for example;
- Contact between the authorities of notified countries (receiving MS) and flag state should be conducted directly through the new system, to increase timeliness and communication; and

- Member States that currently have limited or no IT systems, highlight the requirement for increased training, in order for any centralised system to be effective.

The major difference in responses was seen between those MS with advanced IT systems for managing CC data and those with less developed systems, often due to the simpler requirements of their national systems. The level of knowledge and utilisation of the current CC system is therefore often higher in the MS with developed IT systems. Clearly, a centralised system will need to be capable of meeting all levels of MS requirements, simple enough for the smallest MS and yet robust enough for the demands of those with the highest levels and complexity of imports.

Furthermore, as indirectly highlighted in the MS responses, and directly by the NGO coalition, there is no standardisation between MS as to what constitutes a verification or inspection, and the procedure to conduct this, thus forming an 'un-level playing field'.

The coalition of NGOs had similar concerns to that of the MS competent authorities, in that the lack of a centralised information system precludes cross-checking CC presented at multiple borders around the EU, for example. The coalition also echo the views of the MS competent authorities with regards to the duplication and verification of CC in the current system.

Member States also raised the issue of the unstandardized and inconsistent nature of MS reporting with regards to the biennial reports; with questions left unanswered or left open to interpretation. They highlight the difficulties of monitoring the CC situation with limited information.

Many of the views highlighted above, are also mirrored in some of the additional comments section of the 2014 MS biennial reports:

Several MS are calling for a paperless CC system, and that this process should start as soon as possible. This is in support of the recurring claim that a centralised system (database or IT system) would make the implementation of IUU regulations much smoother and stronger. One MS report goes further by suggesting that the development of such a system may assume the responsibilities of the flag state to monitor its own exports, so it must be clear that the purpose of the centralised database is to feed back a cross check to the flag states or processing states. It would also be useful to have a link to all the fisheries management measures applicable within a region or at a national level.

Some MS suggest that the system could follow the framework of the TRACES system for veterinary checks, and that electronic input of CC information by operators should be a requirement. A system where third countries' competent authorities have the possibility to create health certificates, that can be cloned directly into the control document (CVED) and where importers accept their responsibility for the consignment in the system.

Some MS also call for the creation of a centralised warning system, or 'rapid/ community alert' system, with all MS having access to online messages, perhaps built into the centralised IT system. However other MS are already struggling to fully implement the reporting of CC through their IT-system.

4 Overview of TRACES

TRACES defines itself as a “multilingual online management tool for the control and certification of trade in animals, products of animal origin, feed and food of non-animal origin, as well as plants, seeds and propagating material”.

The aims of TRACES are to; strengthen cooperation, facilitate trade, speed up administration, improve risk management and enhance the safety of the food chain.

The functions included in the system to achieve these aims are:

- Traceability through keeping track of the movements of a consignment, both within the EU and from non-EU countries;
- Exchange of information between traders and competent authorities in order to easily; obtain information on the movement of consignments and automatic notifications.
- Centralising data, enabling statistics and reports to be produced;
- Producing official documents in multiple languages; and
- Risk management, through traceability of consignments when a problem is discovered, and helping to manage rejected consignments.

The main users of the system are traders and the competent authorities in the exporting and importing countries. The Commission, particularly DG SANTE, manage the system, and analyse data within it. Figure 6 shows the main users of the system and their interactions.

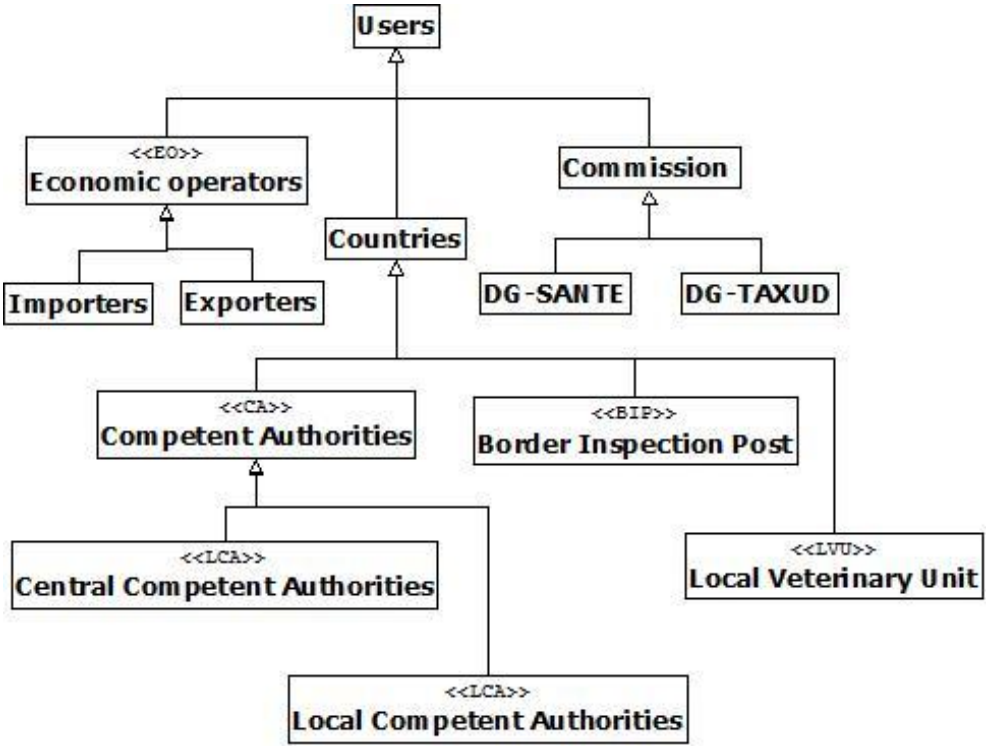

Figure 1. Users of TRACES.

Figure 2 provides a model of TRACES, highlighting the main components of the system and how they relate to each other. The core of the TRACES system is the management of information concerning consignments, the decisions made about them and the controls that

they are subjected to (parts 1, 2 and 3; Figure 2). The model indicates which stakeholders from

Figure 1 have access to particular parts of the system:

Part 1 is utilised by the economic operators in order to create the consignments that enter the system; **Part 2** is available to the competent authorities and border inspection points to record decisions regarding the consignments, and; **Part 3** refers to the control.

Outside of the core workflow are the modules that facilitate the system, the 'communication module' generates notifications and emails to the users at the correct stages and are accessible to all system users. The 'generate documentation' module creates the appropriate documentation in multiple languages. 'Interfaces with other systems' allows TRACES to make data available (downloading only) to national systems, in some countries it has been linked to customs systems. National systems can also be used to update two of the reference lists used by TRACES, the list of economic operators, and the list of cities in each country, this enables maintenance by the competent authorities in those countries. Other EU-wide systems that TRACES links directly to, and can update, are the; Rapid Alert System for Food and Feed (RASFF) and the electronic Bovine passport Exchange (BOVEX). To insure interoperability all other lists used in TRACES are centrally controlled, such as the Combined Nomenclature of the EU which itself is based on the Harmonized System of the World Customs Organisation. The 'reporting and statistics' module allows for the centralised collection of information, which simplifies reporting, and also used to run data modelling routines used to make decisions on consignments.

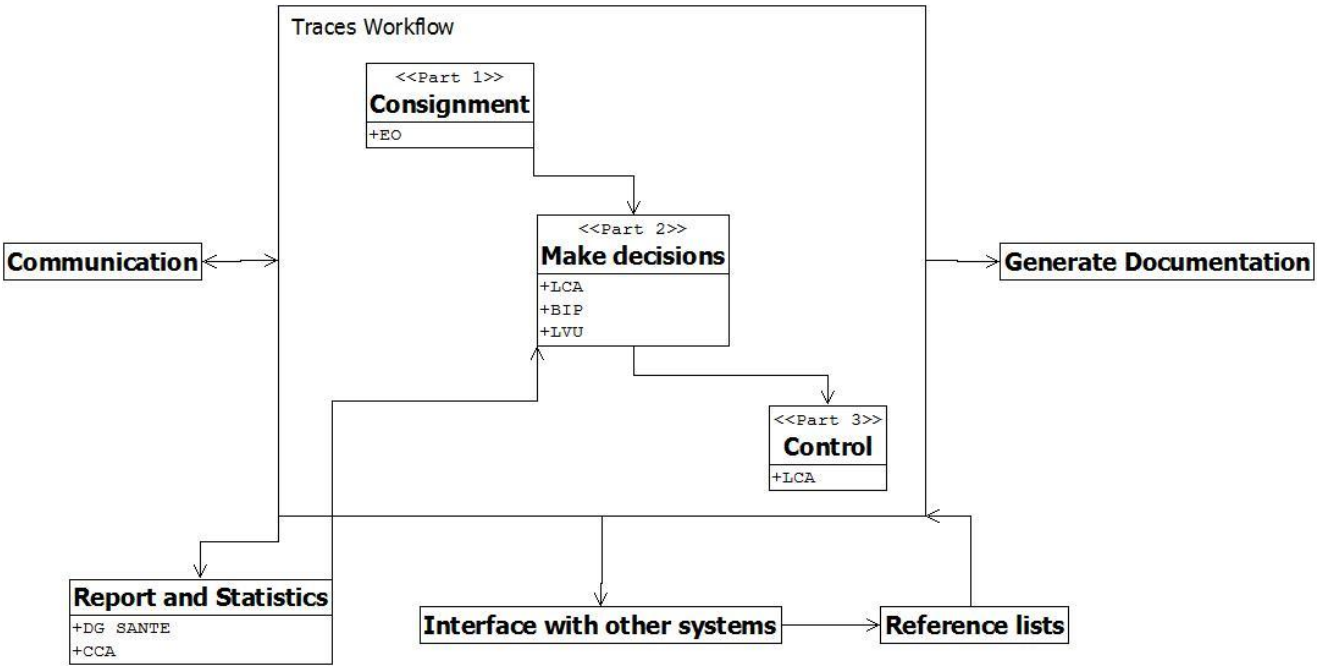

Figure 2. Model of TRACES.

To show how information moves through the system, section 4.1 follows the steps required for a consignment to be created and certified through TRACES, to the point that it can enter an EU country.

An overview of how an example certificate would be processed through TRACES is found in section 4.1.

4.1 Example certificate

In the current TRACES system the Common Veterinary Entry Document (CVED) is the most analogous, in terms of functionality, to the IUU CC. To demonstrate how TRACES might work for a CC a demonstration of how the system handles a CVED will be described. Reference back to the model in Figure 2 will be made to show how the model relates to the system.

TRACES splits its workflow into three parts:

1. Creation of a consignment;
2. Make and record all decisions on that consignment by the competent authorities in both the exporting and importing countries and;
3. Record of the controls placed upon the consignment once a decision to validate the consignment has been made. Part three is mostly related to animal welfare, and so not relevant to CCs.

TRACES **Part 1**, starts with a consignment of goods being created by an exporter. Exporters and importers are collectively referred to as economic operators (EO) in TRACES. To use the system, EO's must first be registered. This registration may be completed by the EO's themselves, whose registration will then be activated by their relevant Competent Authority (CA), or the CA may enter the EO directly into TRACES as a user. Once an exporter is registered on the system they are able to create consignments.

A consignment in TRACES is made up of 5 forms:

1. **References**: unique numbers, some generated by TRACES such as the CVED Reference number, and some externally.
2. **Trader**: used to record details such as; consignor, consignee and importer, as well as the destination, means of transport and expected arrival date.
3. **Commodity**: using the Combined Nomenclature (CN), details of the product being exported are recorded, as are the species and the net and gross weights (Figure 3; screen capture).
4. **Transport**: records the name of the transporter, means of transport and associated dates.
5. **Purpose**: recorded if the consignment is for importation, transferred for transhipment or to a 3rd country.

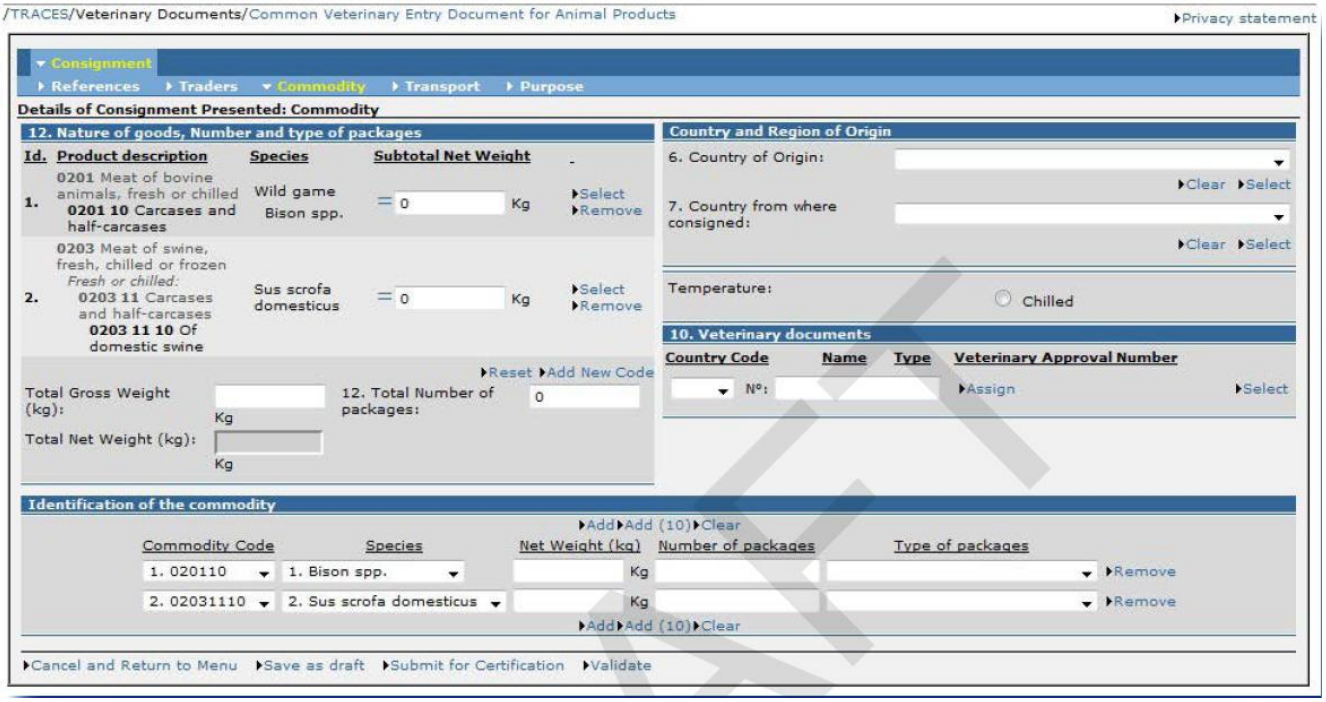

Figure 3. Commodity page in TRACES.

Once a consignment has been created it can then be submitted for certification. This requires the user's password to "sign" the submission in the system. Once the consignment has been submitted all details will be available to the CA, who will also be notified of the new consignment through the communications module. The consignment now enters **Part 2** of TRACES (Make Decisions; Figure 2), first the CA in the exporting country will use the module to make the decision whether to accept or reject the consignment. The CA in the receiving country will then use the same modules to make a decision on the consignment.

Part 2 starts with the 'Help To Decision' module, that provides the CA with EU-wide information regarding;

- the appropriate (consolidated) basis legislation;
- imposed physical tests (if any);
- similar rejected consignments (if any) and;
- safeguard measures and RASFF (if any for EU only)

The appropriate legislation will be linked directly to EU EUR-Lex system, which provides access to all EU laws. The links displayed will be based on the CN code, species, and country of origin, specified in the consignment.

The "imposed physical tests" shows the percentage of physical checks that have been made for a specific commodity for all BIP's in the country, and for the particular BIP where the CA is located. It also has a data mining section (Reporting and statistics; Figure 2) that is designed to improve the random execution of checks. 'Data mining' uses decision models based either on the documents in the consignment of the same commodity codes, or the country and the document in the consignment that have the same commodity codes, or the BIP and documents in the consignment that have the same commodity codes. A screen capture of this section of TRACES is shown in Figure 4.

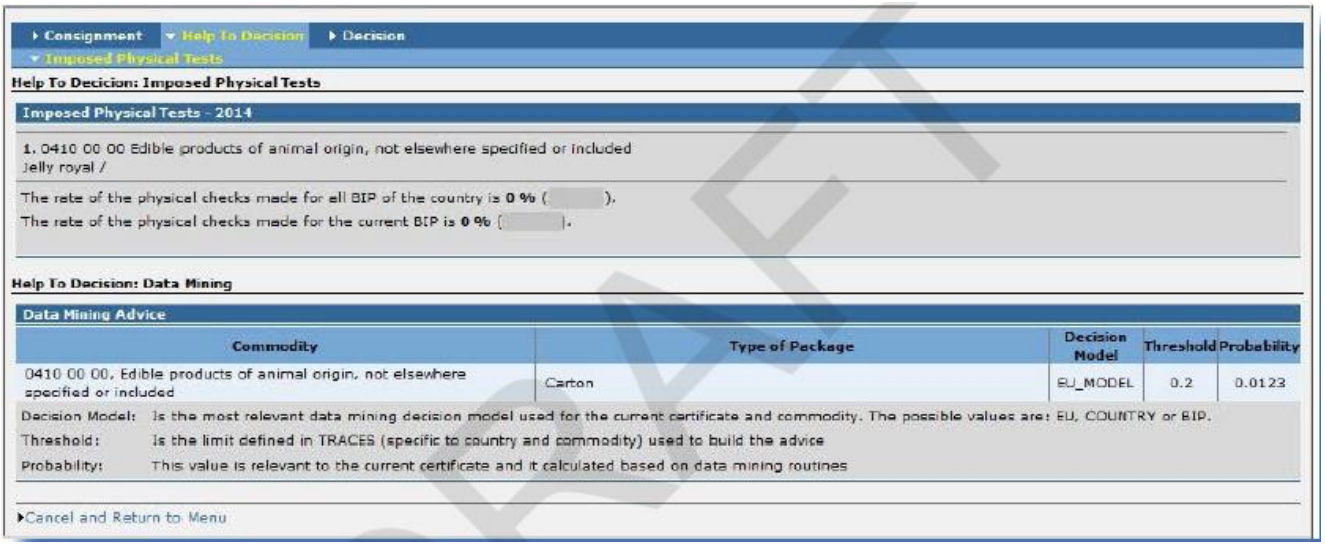

Figure 4. Screen capture of Help to Decision Tool.

The CA is then required to consult the “similar rejected” tab that shows similar consignments that have been rejected at the border of that country or any other EU Borders. The similar rejected consignment may be from the same organisation, region or country.

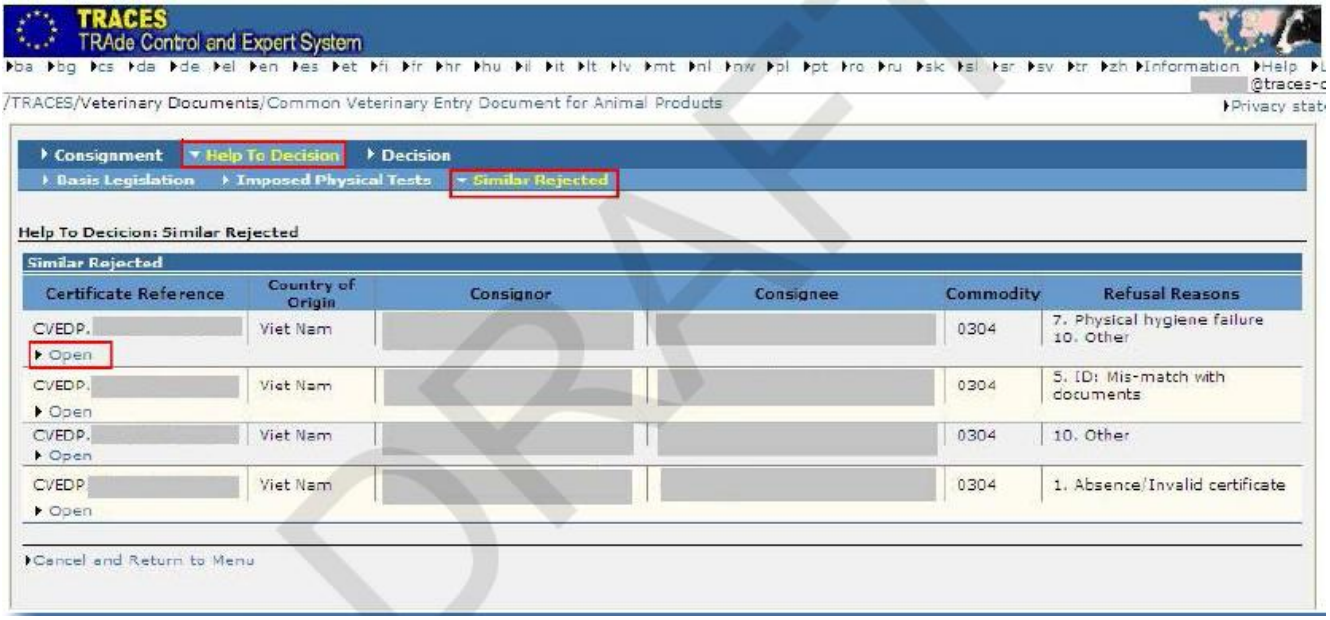

Figure 5. Screen capture of similar rejected.

Where the CA is at the EU border, the ‘help to decision’ model will identify if the consignment is currently subject to a notification under the ‘Rapid Alert System for Food and Feed’ (RASFF). If a consignment in TRACES is rejected on the grounds of public safety, (Reasons for rejection could include, physical hygiene failure, chemical contamination, micro biological contamination, or “other” with the purpose of creating a RASFF notification), TRACES automatically prompts the user to enter the required information to generate a RASFF notification. Data that is already in TRACES will be used to complete the forms where available (e.g. CN codes used in the consignment), remaining information will be completed by the user at the BIP rejecting the consignment. Required information includes; type of notification being generated and who was responsible for generating it. Once a notification is

created it will be sent to the RASFF 'Contact Point' in the MS of the BIP generating the notification. The 'Contact point' then makes a decision to either accept the notification or annul it. If the notification is accepted it will become an official notification, and subsequently sent to all MS using both TRACES and RASFF. TRACES will then highlight any consignment from a third country, part of the third country or the establishment from which the non-conforming products originated, depending on the level assigned in the RASFF notification.

Notifications may also be created or rejected centrally, at the commission level, who act as managers of the system. It is also possible for EU safeguarding measures to be declared independently of the TRACES system (either by the EU Commission or a MS), subsequently displayed in TRACES, and TRACES will then highlight consignments covered by the measure.

If a RASFF notification is in place, reinforcement checks may be applied to consignments at three levels; any consignment from a third country; part of the third country or; the establishment from which the non-conforming products originated. If reinforcement check are in place, then 10 consecutive consignments will have to be checked and passed before the reinforcement checks are lifted. TRACES is used to monitor the result of these checks, and will collate the results across the EU.

Once the CA has reviewed the information in the "Help To Decision" module, they may move on to sign and validate the information provided. This validates that the CA has checked that all documents required for that consignment have been submitted, and that checks (including physical where required) have been completed. In TRACES, this is done by entering a password to "sign" the following delectation "*I the undersigned official veterinarian, or designated official agent, certify that the veterinary checks on this consignment have been carried out in accordance with EU requirements*". Once a consignment has been certified by a CA at the EU boarder, the consignment has passed the checks required and can legally enter the EU. This is recorded in the decision section of TRACES, along with records of the checks made, the results of any tests and if the consignment is accepted or rejected. The checks section acts as a check list, and records what checks have been made (Figure 6; provides a screen capture).

The documentary checks are to verify that all the required documentation with the consignment are present and correct. The Identity check is to ensure that there is consistency between the documents and the consignment presented at the CA. The physical checks will be inspections of the consignment, conducted in accordance with relevant legislation.

The laboratory test section allows more details to be recorded on the specifications of the test. Details of a laboratory test can only be entered if full identity check have also been carried out on the consignment. The laboratory test tab will link back to the checks tab, and allow details to be recorded; the methods used, the samples, and ultimately whether the test was satisfactory, non-satisfactory or non-interpretable.

The current laboratory test are not directly relevant for CCs, but demonstrate that TRACES can capture this kind of information.

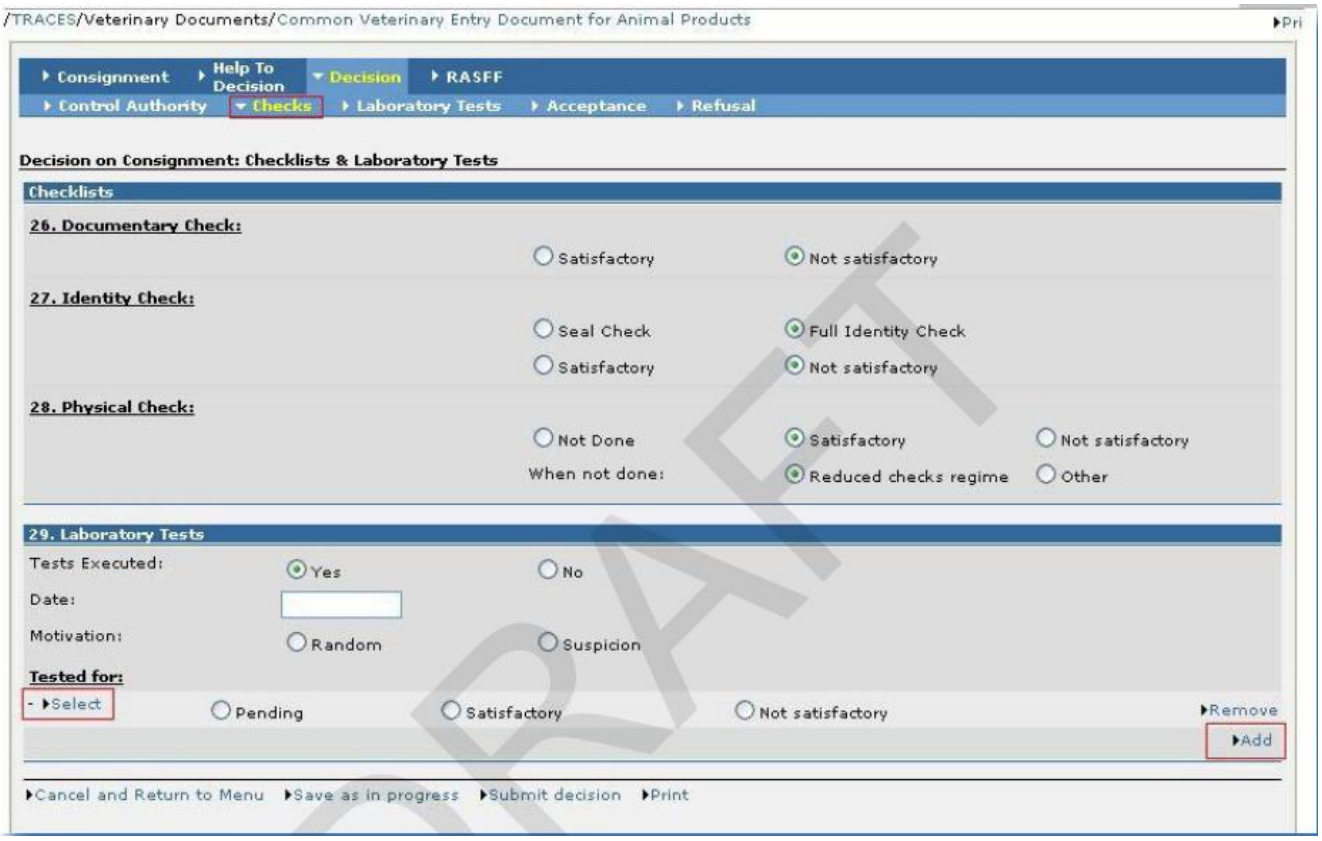

Figure 6. Screen capture of Checks.

Quantity Checks

For live animals TRACES automatically checks the numbers of animals in a single consignment against the predefined limit. If the number exceeds that quantity, an alert is generated that will require the users to check the quantity before validating. If the CA choses to ignore the alert and validates the entry document, then a notification messages about that consignment is sent to the EU. The current limits for live animals are shown in Table 2.

After completing the checks the CA can then either accept or reject the consignment for a particular use. The screen capture in Figure 7 shows the options.

If the CA at the BIP refuses the consignment they must also record why it was refused. The screen capture in Figure 8 shows the options

Table 2. Quantity check limits for live animals specified in TRACES.

CN code	Description	Species	Maximum quantity
0101	Live horses, asses, mules and hinnies		100
0102	Live bovine animals		300
0103	Live swine		12000
010410	Live Sheep		1500
010420	Live Goats		1500
0105	Live poultry		200000
010611	Primates		50
010612	Whales, dolphins and porpoises		20
010619	Other Live Mammals		100
		Artiodactyla	300

CN code	Description	Species	Maximum quantity
		Perrissodactyla	15
		Proboscida	15
		Rodentia	10000
		Lagomorpha	10000
010620	Reptiles		1000
010631	Birds of prey		50
010632	Psittaciformes		1500
010639	Live birds (excl. birds of prey, psittaciformes, parrots, parrakeets, macaws, cockatoos, ostriches and emus		10000
010690	Other Live animalsexcl. mammals, reptiles, birds, insects, fish, crustaceans, molluscs and other aquatic invertebrates and cultures of micro-organisms, etc.		1000
030110	Live ornamental fish		40000

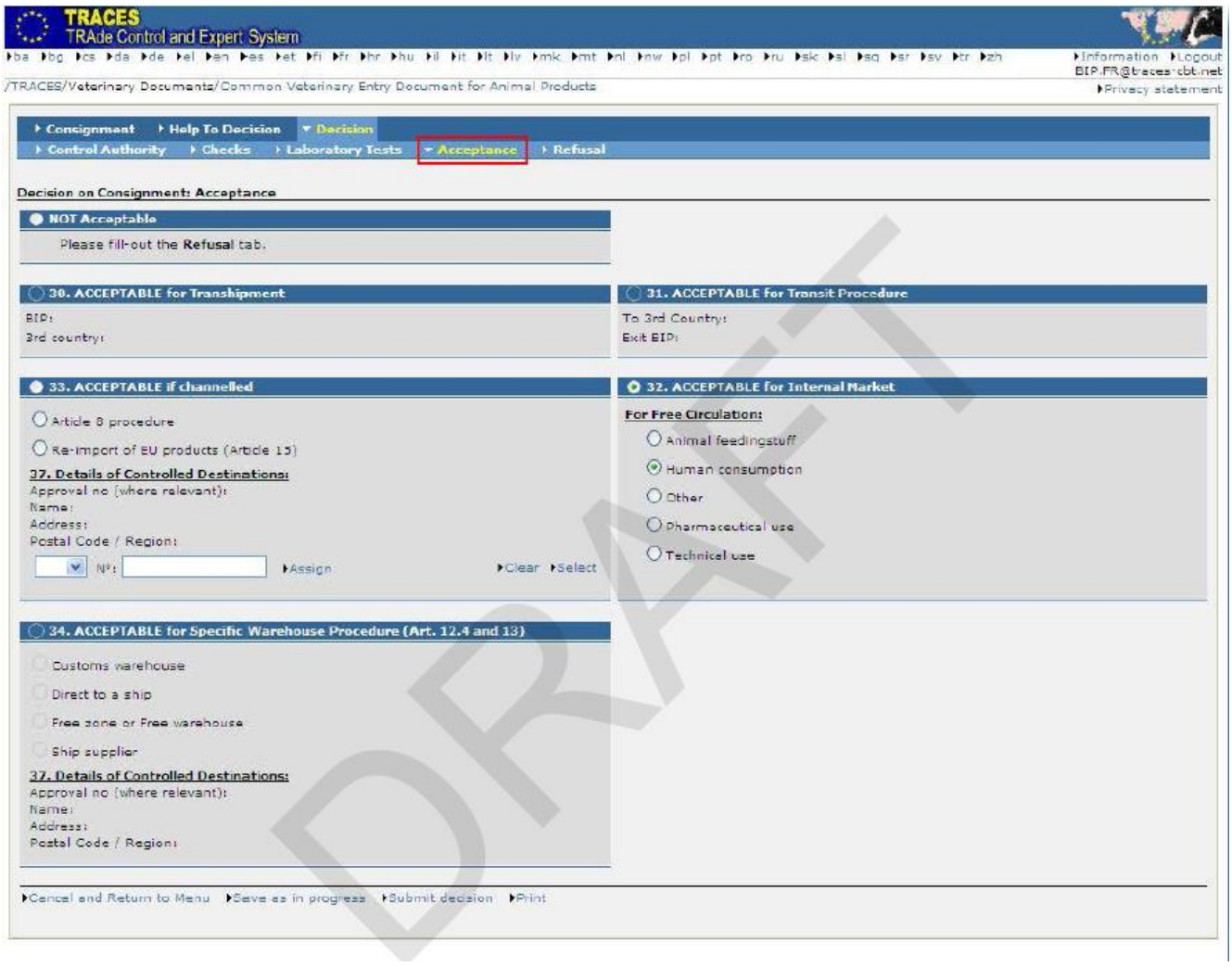

Figure 7. Screen capture – "Acceptance".

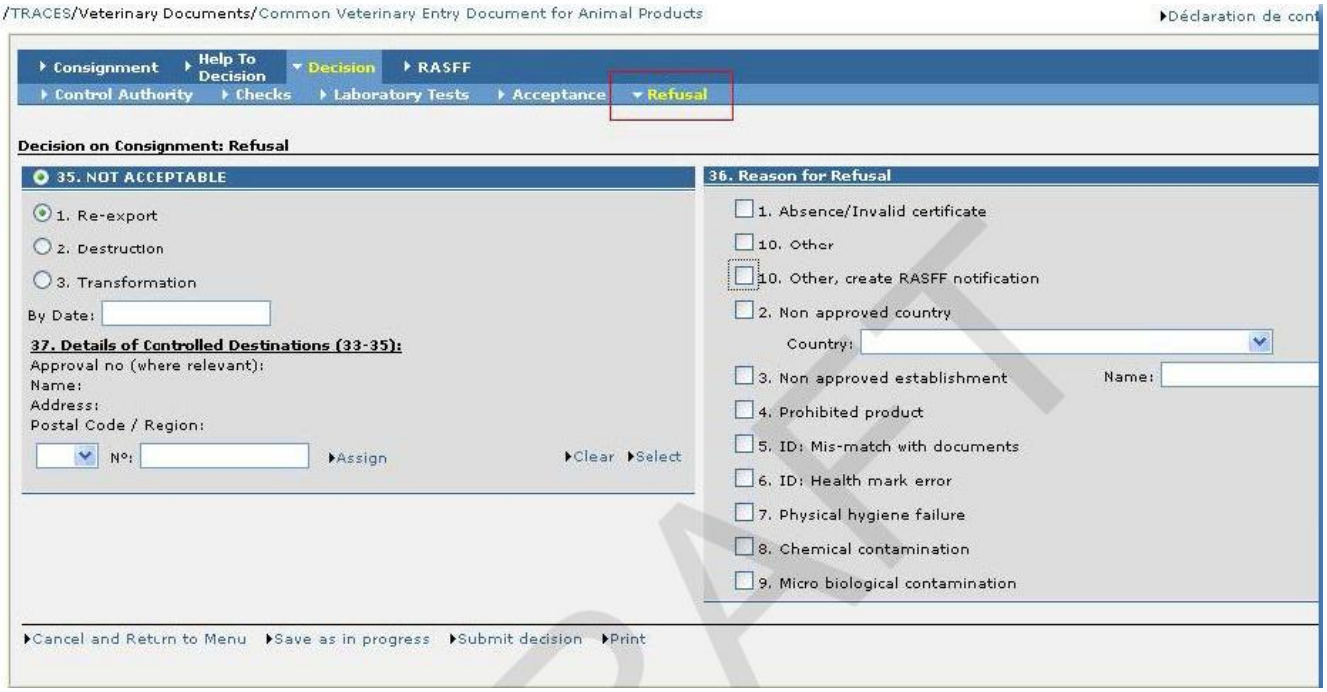

Figure 8. Screen capture – "Refusal".

A minimum of one reason for refusal must be selected, but the CA may delay completion in the follow-up actions in the "not acceptable" section for up to 60 days.

Once consignments have been validated, they can be subjected to controls, and enter **Part 3** of TRACES, which relates to the controls placed upon live animals once they have entered the EU; such as welfare checks during transport and are therefore not relevant to CCs.

4.2 TRACES Users

Although TRACES is run by the European Commission's Directorate-General for Health and Consumer Protection, it is utilised by authorities within the EU and abroad. To our knowledge, there are approximately 76 countries registered as using TRACES, including the 28 EU MS. This includes 16 countries from Africa, 4 from Asia, 5 from Oceania and 12 from the Americas. The top 50 countries in terms of presenting CCs to the EU are presented below, from those 50 countries those that use TRACES account for over 57% of all CCs in the EU (Table 5). The biggest CC producing flag states not currently utilising TRACES, include China and Thailand.

Table 3. The number of Catch Certificates entering the EU by country of origin, between 2010 and 2013, it also highlights the countries in the top 45 CC producing flag states that currently utilise TRACES (not for CC).

Country	Code	Number of CC's processed	Percentage	TRACES User
Norway	NO	103173	15.16%	Y
Other countries (nei)	ZZ	97444	14.32%	
Morocco	MA	62367	9.16%	Y
Iceland	IS	34239	5.03%	Y
United States of America	US	31598	4.64%	Y
Thailand	TH	27573	4.05%	
China	CN	27262	4.01%	
Greenland	GL	24998	3.67%	Y
Senegal	SN	17561	2.58%	Y
India	IN	17176	2.52%	

Country	Code	Number of CC's processed	Percentage	TRACES User
Canada	CA	16864	2.48%	
Chile	CL	16820	2.47%	
Viet Nam	VN	16771	2.46%	
South Africa	ZA	15914	2.34%	Y
Croatia	HR	13032	1.91%	
Spain	ES	12639	1.86%	Y
Maldives	MV	11332	1.66%	
Peru	PE	10933	1.61%	
Faroe Islands	FO	10249	1.51%	Y
Mauritania	MR	10008	1.47%	Y
Tunisia	TN	9460	1.39%	Y
Indonesia	ID	9419	1.38%	Y
Namibia	NA	9291	1.36%	Y
Argentina	AR	7504	1.10%	
Russian Federation	RU	7288	1.07%	
Philippines	PH	6524	0.96%	Y
Ecuador	EC	6189	0.91%	Y
Turkey	TR	3851	0.57%	Y
Oman	OM	3365	0.49%	
New Zealand	NZ	3339	0.49%	Y
Korea, Republic of	KR	3047	0.45%	
El Salvador	SV	2853	0.42%	
Egypt	EG	2166	0.32%	
Ghana	GH	1806	0.27%	
Seychelles	SC	1726	0.25%	Y
Taiwan, Republic of China	TW	1661	0.24%	
Brazil	BR	1646	0.24%	
Albania	AL	1622	0.24%	
France	FR	1604	0.24%	Y
Algeria	DZ	1546	0.23%	Y
Suriname *	SR	1395	0.20%	
Panama	PA	1269	0.19%	Y
Cape Verde	CV	1264	0.19%	Y
Mozambique	MZ	1235	0.18%	
Mexico	MX	1216	0.18%	Y

4.3 Capacity Building of TRACES

TRACES is continually being promoted, and training courses are run under the EU Better Training for Safer Food (BTSF) initiative that targets both EU and third country CA and EO. To date over 70 training courses have be held outside of the EU, and the training programme is ongoing.

Inside the EU the current (BTSF) training program for TRACES are run in two year cycles, the previous cycle 2013 to 2014 and the current 2015-2016 cycles consist of eleven, three day training sessions over the two years. The sessions are mainly attended by delegates from EU MS, but they may sometimes be delegates for third countries. Each session will have about 30 participants and the goal of the sessions is that delegates become trainers themselves in the TRACES system, and run national training events when they return to their countries.

An important aspect of the training is to establish a network, so that the users of the TRACES system meet there counterparts in other MS. The training sessions are also an opportunity for feedback to be provided to the developers of TRACES from users.

The experience of the trainers is that most people taking part in the training are able to use the system competently after the first day of training.

The TRACES system has a comprehensive tool kit of training materials for CAs in MS and third countries as well as EOs. These materials include training manuals, training videos, and a training systems, that allows registered users to use the copy of the system prior to the using the live system. A telephone help desk is also available for users if they experience problems.

In addition to the training materials TRACES has promotional materials available through the DG SANTE website, such as newsletters, infographics and videos which support the use of the TRACES system.

4.4 TRACES and other systems

During the study no evidence was found of TRACES directly interfacing with industry or commercial systems. All the interfaces that TRACES has are with other EU systems or with national systems.

TRACES currently has 3 pilot projects that demonstrate how the system is developing and interfacing with other systems. Most recently is the certification of organic products accordance with regulation 1235/2008, a pilot phase is expected to start in early 2016 that will oblige MS to use TRACES for certification.

Currently being used by 5 MS (Belgium, France, Greece, Italy, and Spain) is the data exchange between national databases for bovine identification (BOVEX). This pilot is linking national database to exchange the information on bovine passports.

Finally in addition to the direct links made between customs systems and TRACES in France Spain and the UK, there has also been a generic interface called SPEED 2 developed, this allows for connections between TRACES, the DG TAXUD system and national systems. This interface is being used in the Czech Republic, Ireland and Slovenia, and being developed in Bulgaria, Latvia, Lithuania and Poland.

4.5 TRACES Questionnaire response overview

We received eight completed TRACES questionnaires

Although in general, the information contained within the responses was rather limited, some MS provided insightful views on the feasibility of TRACES to accommodate CCs. Two MS respondents had experience of using TRACES in conjunction with CCs. These responses have been subsequently followed up with a telephone interviews. The respondents are users with varying degrees of interaction and understanding of the system. However, generally respondents found TRACES to be very user friendly and transparent. One respondent claimed that the current TRACES is relatively slow, therefore they do not believe it is useful for combating IUU and improving the CC system in its current state.

Another major concern that arose is the inability of TRACES to determine down to species level, i.e. there are only ca.150 animal codes in TRACES, whereas, for fish, the precise species is vitally important, therefore the current TRACES system is not able to cope with the complexity of fish imports.

TRACES has in-built Risk Assessment tools, such as RASFF for feed products, that most respondents believed work very well.

TRACES is commonly used by third countries, and most respondents found that it results in less work if the third countries input data directly to TRACES.

Respondents also commented on the connectivity of TRACES with other ‘add-in’ systems, such as ‘rapid alert’ and ‘Eurolex’.

“*The choice of Traces to be the platform for IUU isa good choice. The importers are already used to using TRACES. Many third countries are using TRACES and a lot of the information needed for catch certificates is already in the system*.”

“*It is already possible to add in TRACES IUU Catch Certificates to the consignments with fish, as scans (.pdf or .jpg).*”

The conclusion is that TRACES, although not the most flexible of tools, is a suitable platform to build any future CC system from. Although, in its current form it is not appropriate and would clearly benefit from an additional ‘add-in’ for CCs. The requirements of the CC system and how TRACES fulfils them are presented in Section 5.2.

5 Analysis of TRACES and the requirements of a catch certificate system

This section of the report outlines the requirements of a catch certificate system, and subsequently indicates where the current TRACES system includes the functionality to fulfil these requirements.

5.1 Summary of requirements

The requirements detailed below are split into three logical types commonly identified as part of a functional and technical database specification:

- **The business requirements** are the high level concepts that the system will be required to fulfil i.e. what jobs is the database required to do. These may be broad concepts that will be broken down further in the functional requirements. Many requirements will be stated in this way, but some will be specifically stated by users as a specific task, i.e. a functional requirements.

- **The functional requirements** define what the specific tasks the system is expected to do. These requirements should be at the single task level.

- **Non-functional requirements** these should define how the system behaves, and are effectively constraints on the functional requirements. This would include how the system would work, when it should be available to users, how it should be implemented i.e. not specific to a task but to the system workings.

The requirements for the CC system can be summarised and categorised as follows; Business requirements are summarised in Table 4, specific Functional requirements in

Table 5 and non-functional requirements in Table 6. For each requirement the source of the requirement is noted i.e. from Member State reports, stated system purpose or from the NGO coalition.

Table 4. Business requirements (see Section 5.1.1).

Requirement	Source
Decrease risk of IUU products entering EU market	EU (System purpose)
Create level playing field between (for both MS and EO)	EU (System purpose)
Connection to TRACES	DK, FR, CY, PT, NGO Coalition
Contact database for third countries	BG, DK, IE, FR, CY, MT, SI
Common database	BG, DK, DE, IE, EL, FR, CY, MT, PL, PT, SI, SE, UK, NGO Coalition
Link to CMMs, quotas etc.	EL
Improved timeliness	BG
EU wide risk assessment process	BG, NL, SI, UK, NGO Coalition
Multi-language interface – removes communication barriers	BG
Links to other 3rd country database systems to reduce time	DK, FR
Better control of re-export / re-import for processing.	EL
Use of system for generation of standard data requests to meet obligations	FR
Use system to assist in Mutual Assistance Requests	FR, NGO Coalition

Requirement	Source
Phasing out of the paper-based CC system entirely	NGO Coalition
Requiring effective tracking of product transformations along the supply chain into the EU	NGO Coalition (within 5 – 7 years)

Table 5. Functional requirements (see Section 5.1.2).

Requirement	Source
Central interface for rapid alerts	DK, PL
Mass balance at certificate level - Countdown for products entering EU	DK, LV, SI
Management of split consignments	DK
Record of cancelled and rejected certificates	DK
Individually numbered catch certificates	BE
Additional information on CC · Fishing Area; · Landed and Processed Weights; · IMO Numbers; · Permits and Licences; · Conversion Factors); · Fishing method ; · Dates and times of fishing; · Geolocation of fishing activity; and · Refined product codes.	CY, NGO Coalition
Include information on IUU vessels, companies and country lists and alerts (EU, U.S., RFMO, Interpol)	NGO Coalition

Table 6. Non-functional requirements (see Section 5.1.3).

Requirement	Source
Standardisation - Uniform rules and data, customs codes, ASFIS codes	BG, CY, LT, PT, EL (ASFIS)
Single database of fishing vessels	PT
Links to licensed vessel lists in 3rd countries	EL
Ensuring any electronic systems established are expandable and adaptable	NGO Coalition
Combining modernisation process with outreach & capacity building in third countries	NGO Coalition

For each requirement, a SWOT (Strengths, Weaknesses, Opportunities and Threats) table has been developed.

5.1.1 Business requirements

5.1.1.1 Decrease risk of IUU products entering EU market

This is the original purpose of the IUU regulation and CC system, and should therefore provide the basic underlying purpose for any CC database system. It is strongly recommended that an updated TRACES system should include CC monitoring functionality that allows the monitoring of all imported fish through their CC and be able to assist in the identification and tracking of any suspected IUU fish. This will allow MS control agencies to deny entry of illegal fish into the EU market.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** Tracking of individual CC across EU MS.	**Weaknesses:** One system, may require distributed system or redundancy to work effectively.
External	**Opportunities:** See below.	**Threats:** EU MS or external States do not wish to move to a centralised electronic system.

5.1.1.2 Create a level playing field (for both MS and EO)

As an underlying principal of IUU regulation, it is strongly recommended that any system developed to implement it should create a level playing field between all Member States and Economic Operators within the EU. The system should be equally available to all Members and address the concerns of all, regardless of size or complexity. Using TRACES as the basis for any system development would ensure a level playing field across Member States.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** Single system creates level playing field.	**Weaknesses:** None
External	**Opportunities:** Creates a fairer market Can create better access to market	**Threats:** MS and external States not wishing to move to an electronic centralised system.

5.1.1.3 Common database

A common electronic database of all CCs across the EU has been highlighted by 13 MS (BG, DK, DE, IE, EL, FR, CY, MT, PL, PT, SI, SE and UK) and the NGO Coalition (Rec #1). A common database of CCs, developed as an additional module to TRACES, would provide many benefits *inter alia* up to date records of all imports, potential for mass-balance at the CC level, risk analysis at an EU-level where information on high risk vessels is available to all MS immediately, records of rejected consignments etc. This requirement is therefore strongly recommended.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** Up to date records of CC of all imports. Mass-balance at the catch certificate level. Linked to current TRACES database records of imports. Enhanced risk analysis at an EU level where information on high risk vessels is available to all MS immediately	**Weaknesses:** None
External	**Opportunities:** Simplified unified system allows reduced training and awareness inputs / costs	**Threats:** MS and external States not wishing to move to an electronic centralised system.

5.1.1.4 Connection to TRACES

As suggested by the purpose of this report, a connection to the existing TRACES system has been explicitly suggested by Cyprus, Denmark, France and Portugal in MS biennial

reports. As an existing system, currently used to track the imports of animal products into the EU, that has been deployed and is operating effectively both within and outside of the EU, TRACES provides an opportunity for a cost-effective and efficient expansion to be able to manage the CC system electronically. A “Single Window” system based on TRACES would be preferable for Denmark (telephone interview), as staff are already familiar with it and experience would enable a quicker uptake. It is therefore strongly recommended that any solution uses the TRACES system as a basis for development.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** Uses existing system as a base. Proven track record. Staff and training system already in place.	**Weaknesses:** May not do exactly what is needed from an EU CC system.
External	**Opportunities:** TRACES is an existing high quality system with a proven track record and EU CC system could build upon this.	**Threats:** TRACES may not wish to be “encumbered” by an EU CC system.

5.1.1.5 Contact database for third countries

One of the key recommendations put forward by EU MS in their biennial report was to provide a database of the contact details of third country representatives (BG, DK, IE, FR, CY, MT, SI). Where contact details are not readily available this may delay imports, restrict the ability of a MS to conduct efficient checks on CCs and physical consignments and impact on any future risk analysis. By adding these contact details as an add-on to a CC database implemented under TRACES, a single database of contacts for all third countries could be made available to all MS. This database would be maintained centrally increasing the efficiency overall.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** Data entry is reduced. Provides contact information for exporting State CAs.	**Weaknesses:** Needs to be updated on a regular basis to remain useful.
External	**Opportunities:** Contacts database could be used for outreach and training purposes	**Threats:** Duplicate entries can cause confusion States may not wish details to be shared.

5.1.1.6 Link to CMMs, quotas etc.

Greece suggested including a link from CCs to relevant conservation and management measures such as those defining quotas closed seasons. This would allow EU MS competent authorities, during the process of deciding to allow or reject a consignment, to verify if relevant conditions had been met, i.e. the fish were caught within an assigned quota, during an open season and by appropriate gear types.

The current TRACES system includes a feature called “Help To Decision” that includes information on legal texts, and checklists. It would be possible to include functionality to provide information on conservation and management measures (CMMs), quotas and related information but this is likely to be significant task in its own right, given the wide variety of sources of fish entering the EU.

It is therefore recommended that if possible a link through an additional module of TRACES should be made to a database of CMMs and quotas where appropriate based on area, species and gear.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** CCs can be cross-referenced against quotas and CMMs to ensure catches are within quota, from appropriate seasons and areas etc.	**Weaknesses:** Requires additional data entry that must be maintained (e.g. annual quota tables) to allow this functionality to be useful.
External	**Opportunities:** Provides basis for good summary analysis of incoming trade based on source fishery, the detail for which has not previously been available in many cases.	**Threats:** Data not available from RFMOs, exporting or coastal States.

5.1.1.7 Improved timeliness and data quality

Allowing information to move between and within organisations in EU MS immediately to enhance the risk analysis and decision making processes is a clear requirement. This requirement underpins the system and is reflected in the non-functional requirements for system access and communication (see Section 5.1.3.1) and the development of an updated system based on TRACES will be able to improve timeliness.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** Central, quick, cost effective system providing accurate and timely data.	**Weaknesses:** Extra data checks may hinder data entry.
External	**Opportunities:** Data available prior to import, allows risk analysis and response to be set in action before fish lands.	**Threats:** May cause bottlenecks in the system where exporting States are competing data entry where previously would have just stamped the form.

5.1.1.8 EU-wide risk assessment process

A number of Member States (BG, NL, SI, UK) and the NGO Coalition (Rec #2) recommend a standardised risk analysis and assessment tool which facilitates the effective processing and verification of CCs within the EU. The risk assessment of incoming CCs should be “risk based, tiered and targeted” and risk criteria must be standardised across the EU. The risk assessment process should be based upon best-practices used worldwide and continue to drive this process forward. A risk assessment process can be based within a module of TRACES or TRACES exports the required data to be used in an external dedicated system.

NB: This requirement is recommended as desirable only because national risk assessment processes already exist and are implemented.

	Positive (Helpful)	Negative (Harmful)

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** Standardised risk analysis and assessment tool can be developed which can facilitate the effective processing and verification of catch certificates within EU MS and across the EU as a whole.	**Weaknesses:** Requires data to be completed and entered in real-time
External	**Opportunities:** Risk assessment can be risk based, tiered and targeted.	**Threats:** Data not available in time to allow risk analysis and assessment to take place. Skewed analysis with skewed data provision.

5.1.1.9 Multi-language interface – removes communication barriers

Any common database should include a multi-language interface to remove communications barriers. Data currently on the CC are not language-dependent and therefore only the interface needs to be multi-lingual. It should be noted that the current TRACES system includes provision for 35 languages and would therefore provide a suitable option to build upon.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** Allows MS and third parties access in their own language – reduces data entry issues.	**Weaknesses:** None
External	**Opportunities:** The catch certificate system would benefit for any increase in the language provision of the TRACES system.	**Threats:** None

5.1.1.10 Links to third country database systems to reduce time

The ability to link any future CC management system with other third county databases to enable efficient data transfer to reduce time and costs of re-entering data would be advantageous.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** Linked updated databases provides key information in quickest possible scenario at the point of validation and / or verification to end user.	**Weaknesses:** Reliant on external system that is not within the control of the Commission
External	**Opportunities:** Uses existing high quality systems to allow effective and efficient data entry to the centralised system	**Threats:** Access to 3rd party systems with direct link to the updated central system may be a weak point of entry.

5.1.1.11 Better control of re-export and re-import for processing

There should be a better system of control for the re-export and re-import of products from the EU for processing outside of the EU. A centrally managed database for CCs should manage the re-export of products simply.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** Full data available of all fish from CCs being exported and reimported after processing allowing a risk analysis to be conducted after fish processed.	**Weaknesses:** Increases the complexity of the system will increase the cost of developing it.
External	**Opportunities:** Contributes to the creation of a levelling playing field.	**Threats:** Greater complexity in the system may lead to more user errors.

5.1.1.12 Use of system for generation of standard data requests to meet obligations

A centrally managed database system would enable the generation of standard data reports to meet data reporting obligations. As all CCs will be recorded in one system, any data analysis of source, species, product etc. could all be managed simply and centrally. The development of a standard set of reports to meet obligation would be relatively simple and these could in theory be accessed directly by the Commission, removing the requirement for direct MS reporting. Reports would also be instantaneous and data representing the current best information available.

It is recommended that these functions could be added on as an additional module to TRACES.

It should also be noted for NGO concerns about transparency that this would also enable standard public level reports to be made available at regular intervals to allow an agreed level of reporting to be presented from the Commission.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** Single system for all data allows simple interface to produce data to meet reporting obligations in standard format. Simpler at receiving end as standard outputs or granted access to database to pull one overall set of EU data rather than 28 MS reports.	**Weaknesses:** None.
External	**Opportunities:** Internal use of data reducing administrative burden from reporting and analysis. Access to data would be timelier, allowing for analysis to be conducted on an ongoing basis.	**Threats:** Reluctance of MS to have DG MARE analysing data.

5.1.1.13 Use system to assist in Mutual Assistance Requests

The ability of MS to issue Mutual Assistance Requests are laid out in Chapter 51 of the IUU Regulation. Any centralised database system, especially when linked to the risk assessment

process should be able to assist in Mutual Assistance Requests. This requirement is strongly recommended although the fine detail of the requirements would need to be clearly defined and agreed between MS and the Commission.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** Central database and system can allow MAR to be made for a particular CC, vessel, fisher, owner or master as required and automatically directed to the appropriate flag, coastal or port State CAs.	**Weaknesses:** Additional functionality may be required.
External	**Opportunities:** Increased control functionality.	**Threats:** Parties do not act upon MARs. Financial support not available.

5.1.1.14 Phasing out of the paper-based CC system

The NGO Coalition has stated that they would prefer to phase out the paper-based system entirely within 5 to 7 years. The possibility of moving towards a paper-less system is unlikely in the next few years given the current level of use of TRACES by third party countries (ca.57%). In the long-term it is recommended that this remains a priority and the outreach recommended in Section 5.1.3.8 would be an effective mechanism to push this aim forward. It should be noted that there may be political obstacles, as it will require a redrafting to the Council Decision and Regulation and would require the agreement of all 28 EU MS.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** More eco-friendly paperless system. Quicker. More effective and efficient tracking of CCs.	**Weaknesses:** Will require all users of the system to have access to electronic systems
External	**Opportunities:** Many opportunities as defined elsewhere in this section.	**Threats:** Some fishing States may not be in a position to implement an electronic system. May require a staged approach.

5.1.1.15 Requiring effective tracking of product transformations along the supply chain

The NGO Coalition has recommended that within 5 – 7 years, a centralised CC system should be capable of the effective tracking of product transformations along the supply chain into the EU, i.e. a batch will be tracked from catch, through all processing and transport elements of the supply chain to the end products. Each step in the chain will record the weight of catch at the start, processing conducted with processing factors and the weight of the product at the end of the step. This will provide a fully defined and broken down mass balance for each batch of fish landed.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** Full tracking of product transformations. Mass balance at the CC level.	**Weaknesses:** Requires industry buy-in.
External	**Opportunities:** Identification of high waste processes and being able to act upon this. Identification of fraudulent processes where conversion factors do not meet industry norms.	**Threats:** Data not available to implemented. Getting agreement on conversion factors may be difficult

5.1.2 Functional requirements

5.1.2.1 Central interface for rapid alerts

A centralised CC system should provide a central interface for an rapid alerts to inform relevant staff when a CC is indicated as being of high risk, e.g. a certificate has been used a number of times over and above the total weight of catch recorded. This was recommended in both Danish and Polish MS biennial reports. This rapid alert should notify not just the latest MS to process the certificate but all previous MS as it will not be clear without further investigation which of the certificates has been used fraudulently.

It is recommended that the system of alerts also feeds into the risk assessment process of individual MS to highlight those economic operators who have had an involvement in the import of fish via fraudulent CCs in the past.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** Central database and system can allow one alert to be made against a particular CC, vessel, fisher, owner or master as required centrally that can then be received automatically by all MS and prioritised for those related MS.	**Weaknesses:** Additional functionality may be required.
External	**Opportunities:** Increased control functionality.	**Threats:** MS do not act upon rapid alerts. Too many alerts become a burden on MS. Financial support not available.

5.1.2.2 Mass balance at certificate level - Countdown for products entering the EU

The centralised CC system should provide a mass balance at the individual CC level. This means that for an individual CC registered in the system, all records of imports into the EU across all MS should be reconciled against the totals recorded on the certificate to ensure that fish up to the amount recorded are imported and any additional catch over 100% of the recorded catch weight would then raise a rapid alert, as described in section 5.1.2.1. It is strongly recommended that at any point in time, it should be possible for a user to select a CC and the overall total weight by species on that CC displayed along with the percentage that has already been imported. It is further recommended that a similar mass balance should be created for re-exports from the EU to ensure that EU MS are not re-exporting catch.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** Allows full mass balance to be conducted for a single CC across all MS. All consignments easily tracked back to their originating CC.	**Weaknesses:**
External	**Opportunities:** Additional factors to risk analysis through the results of regular mass balance assessment reports. Mass balance >100% can be used to flag high risk vessels, suppliers, fisheries etc.	**Threats:** The countdown may not be able to distinguish between legitimate and illegitimate imports. If imports are >100% imports that are legitimate may be barred

5.1.2.3 Management of split consignments

In addition to the recommendations above, all catch recorded on a CC should be continually traced through a centralised system if a single consignment is split. This will ensure that all products entering the EU can be traced back to their original source.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** Allows full mass balance to be conducted for a single CC across all MS. All consignments easily tracked back to their originating CC.	**Weaknesses:** None
External	**Opportunities:** Simplify management of split consignments	**Threats:** States not willing to incorporate changes to the numbering systems of existing CC systems,

5.1.2.4 Additional information on Catch Certificates

A number of additional data elements have been requested to be included on CCs). These data would assist in the verification process and supplement data used in national risk assessments. Additional data suggested include:

- Fishing Area;
- Landed and Processed Weights;
- IMO Numbers;
- Permits and Licences;
- Conversion Factors;
- Fishing method;
- Dates and times of fishing;
- Geolocation of fishing activity; and
- Refined product codes.
- Processing statements, scanned copies of original documents (where paper based) and additional documentation (e.g. transport documents) should also be able to be uploaded as scanned documents (.pdf format as standard) and “attached” to an electronic record to allow additional checks to be made via the centralised system.

IMO numbers are currently part of the EU CC template (if used by the vessel) would be irrelevant if a single global register of fishing vessels could be included as recommended

below (Section 5.1.3.5). Fishing vessels are now requested to apply for IMO numbers but this has not been fully implemented globally and many still do not have IMO numbers.

Licence data would need to be submitted in a standard format by both Flag States (Authorisations to fish) and coastal States (Fishing Permits / Licences). These data could form a series of tables that define which vessels can fish, when, for a defined amount of what target and bycatch species, in which areas and with what gear. These licence details could then be checked based on the dates and areas fields of the CC. It was noted though in discussions with MS that these data are not checked as standard by some MS as they should have been checked by the validation process of the originating State of the CC and that these validations should be trusted.

The other data requested are modifications and confirmations of data already on the template CC form. Currently, for example, the catch area(s) and dates are requested on the CC but the requested data have more clearly defined fishing area, dates and times of fishing and geolocation of fishing activity (which may include for instance validated VMS or AIS data to show where catches were made). The availability of such data should be considered during the development phase of any new TRACES based CC system. **Error! Reference source not found.** shows that there are countries such as China and Thailand that are not currently using TRACES and therefore would need to start using TRACES before they can be used to track electronic CCs, which may produce a political obstacle. Even if States use TRACES for customs use, the simplest solution with attached documents only i.e. no additional information (as described in Option 4, Section 5.2.4) that some of the additional information identified here as being useful for the CC system to record may not be available digitally, as these data will be recorded as digital information in an attached graphic. To be of use these data may need to be captured.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** High quality data recorded with CC allows more efficient and effective validation and verification.	**Weaknesses:** Additional functionality required. A small amount of additional funding may be required to incorporate into the system.
External	**Opportunities:** Analysis could be more sensitive. Addition data may enable new analysis's and risk assessments to be performed.	**Threats:** Lack of additional funding. Reluctance of external States (and fishers) to provide such information.

5.1.2.5 Record of cancelled and rejected certificates

It is strongly recommended that all cancelled and rejected certificates should be recorded in the system and marked accordingly. Maintaining this record was recommended by Denmark and it is clear that this would be advantageous in highlighting those economic operators who regularly submit cancellations for CCs or have consignments rejected. These economic operators could then be highlighted in national risk assessments more easily.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** All records of certificates are maintained allowing checks to be made on all records. Risk assessment can also include the number of cancellations or rejections as a factor.	**Weaknesses:** Additional functionality required. A small amount of additional funding may be required to incorporate into the system.
External	**Opportunities:** Information that had previously only been available at the national level, will be available across the EU.	**Threats:** Lack of additional funding.

5.1.2.6 Individually numbered Catch Certificates

All CCs should be individually numbered, and the number should appear on every page of a certificate. This links in to the concept of split consignments and that any CC that is "split" should allow for the daughter certificates to be linked to the mother record to ensure that mass balance equation.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** Simple unique IDs Helps the development of a database system if all CCs are unique.	**Weaknesses:** None
External	**Opportunities:** An EU wide system will enable a unique numbers to be created for certificates. And that all the information on a certificate is linked to that number.	**Threats:** Requires external States to comply.

5.1.2.7 Include information on IUU vessel, company and country lists and alerts (EU, U.S., RFMO, Interpol)

A centralised database of CCs should have additional data available within the system to allow those processing CCs to check relevant details. This will include RFMO IUU vessel lists (preferably linked to a centralised vessel list), those countries banned from exporting catch to the EU and alerts such as INTREPOL purple notices. These data will enable MS to refuse entry of fish based on high risk criteria at an early stage increasing effectiveness and efficiency.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** Linked updated databases provides key information at the point of validation and / or verification to end user. High risk IUU fish or from blocked vessels will not be able to enter the EU.	**Weaknesses:** None
External	**Opportunities:** Provides enhanced information to be used in risk assessments.	**Threats:** External data sources are not kept up to date leading to a weakness in the system.

5.1.2.8 Support risk-based analysis

The system should, as part of the standard functionality provided, support any risk based analysis conducted by the Commission or by EU MS. This should be as a combination of standardised outputs from the system itself or to provide a set of standard outputs from the system that can be incorporated into national systems to enable EU MS to continue to run their own risk analyses with the most timely and accurate data available. For example, a mass balance "countdown" for a certificate would enable MS to conduct crosschecks, including allowing MS to identify CCs that are being over-used (currently easy to use a single paper certificate multiple times in different MS) or for MS to be able to identify fraudulent certificates that have not been validated by their State of origin.

The data on a CC is extremely valuable in identifying high risk consignments. In addition to those consignments that are related to over-allocated CCs, the identifiers of the vessel, master, flag and economic operators can all be used by EU MS to identify high risk consignments. Specific queries and data extraction routines should be developed and added as a module (or function of a module) to enable this to happen. TRACES incudes crosschecks at several points through the system, that could support a risk based analysis, for example dates associated with a consignment will need to follow a logical order, i.e. the declaration date cannot be after the certification and the departure date cannot be before the certification date. Any certificate that does not meet these consistency checks will be highlighted as higher risk. In addition, there are several checklists that need to be competed in the 'make a decision' stage in the model of TRACES, shown in Figure 7.

Completing the checklists is facilitated by the "Help To Decision" tool in TRACES, which provides information on four areas that can help complete the checklist, highlighting similar consignments that have been rejected, or that are subject to notifications made under the 'Rapid Alert System for Food and Feed' (RASFF). Many of the consistency checks that are within TRACES will be applicable to the implementation of a CC system, however it is likely that additional checks will be required. The modification or extension of the "Help To Decision" tool would also be an important component of a CC system and could replicate the RASFF notification with IUU notifications such as countries with red or yellow cards. Changes to the "Help To Decision" tool will need to be prioritised to ensure only the most useful crosschecks are implemented. Once a prioritised list of crosschecks has been made the current developers of TRACES and statistical expert can collaborate on developing a decision models specific for CCs.

	Positive (Helpful)	**Negative (Harmful)**
Internal	**Strengths:** Support risk analysis and assessment tools in MS and can therefore facilitate the effective processing and verification of catch certificates within EU MS.	**Weaknesses:** Requires data to be completed and entered in real-time. Potential for numerous different solutions to appear. Harmonised risk analysis coordinated at the EU level or intra MS with assistance of the EFCA would be better.
External	**Opportunities:** Risk assessment can be risk based, tiered and targeted. Linked to EU wide risk analysis	**Threats:** Data not available in time to allow risk analysis and assessment to take place. Skewed analysis with skewed data provision.

5.1.3 Non-functional requirements

5.1.3.1 System access

Although not flagged by any stakeholders the electronic CC system within TRACES will, due to the international and market related nature of the seafood business, be required to be accessed via the Internet 24 hours a day, 365 days of the year.

This will therefore require redundancy to be built into the system to allow for system upgrades, hardware failures etc. to ensure access is maintained at all times while some elements are checked and replaced. Short advertised breaks in service would be possible for upgrades but should be avoided where possible.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** Genuine 24/7 access provided.	**Weaknesses:** Financial investment to provide for technical redundancy to ensure 24/7 access.
External	**Opportunities:** Ensures worldwide access 24/7 from all countries	**Threats:** None

5.1.3.2 Backup and Restore Facility

Although not flagged by any stakeholders the electronic CC system within TRACES will require a clearly defined backup and restore facility, with full transaction logging to ensure data integrity is maintained at all times.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** Mitigates against data loss. Maintains a full transaction log of all catch certificate and related data entry, editing and deletion. Optimal situation for centralised backup and record maintenance.	**Weaknesses:** Transaction logging will reduce the system response times, but this can be reduced with technological solutions. Increased costs of hardware.
External	**Opportunities:** Full traceability internally of data.	**Threats:** None

5.1.3.3 Standardisation - Uniform rules and data, customs codes

Data standardisation will be critical for any CC system and was recommended by Bulgaria, Cyprus, Lithuania and Portugal. Uniformity in the data collected is already specified through the template CC form and although specific forms may vary for national versions, the underlying data structures will be maintained. There will be a need to standardise species and customs codes in a new CC system. The use of ASFIS codes as a standard has been recommended by Greece.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** Standardised data allows simpler querying and analysis of data required for other functionality.	**Weaknesses:** May require additional financial investment to introduce standardisation of data and formats in national systems. EU systems should not be a problem but third country systems may require substantial development.
External	**Opportunities:** Standardisation brings in increased efficiency into systems. Will simplify interfaces with other systems.	**Threats:** Financial investment may not be available or deemed low priority by national administrations and may stop or reduce development. Customs codes may not be modified to represent the required level of definition (i.e. to species level). EU MS may be reluctant to change national formats.

5.1.3.4 Interface with other systems

The current TRACES system includes a module called “System-to-System” (S2S) that allows national authorities to search the TRACES database and download data in appropriate formats into national databases. The initial purpose for this was to generate customised reports, but the data may also be used for other purposes at the national level. TRACES is also linked with the customs systems in Spain, France and the UK.

Any centralised system for the management of CCs should be able to interface with other national systems used for the management of Ccs. Data transfer between systems should be simple, either as live access to centralised systems or as a predefined download of data tables (new and updated data) at a regular intervals to allow national systems to be updated.

The TRACES system should be able, through an extension to the existing S2S and List Management System (LMS) module or through the development of additional modules be able to accept CC data already in electronic formats from existing EU MS CC systems (i.e. reducing the burden of entering into another system where one already exists), and reciprocally should be able to export data in a standard format that EU MS CC systems can import data easily.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** Better quality control of data. Increased speed and efficiency of data use.	**Weaknesses:** May require additional financial investment to develop interfaces.
External	**Opportunities:** Minimisation of data entry (reduction in administrative tasks) by transferring data between systems. Possible utilisation of existing S2S and LMS modules of TRACES.	**Threats:** Financial investment may not be available or deemed low priority by national administrations and may stop or reduce development.

5.1.3.5 Single database of fishing vessels

Portugal recommended the inclusion of a single database of fishing vessels in the system. This would be added to the database like the Community Fishing Vessel Register (for EU flagged vessels) and provide a single reference of fishing vessels. This is a topic widely discussed in fisheries management circles and a Global Register of Fishing Vessels has been suggested with an FAO Working Group established to take this forward. When complete it is recommended that this is used as a single data source as it will be the most up to date and accurate single data source available. Having a single source of data would mean that this requirement is feasible as the global record is likely to be updated on a regular basis.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** All CCs will be able to be linked to a specific vessel from a single unified global fishing vessel register. The CC system would use one single independent database source verified by the flag States.	**Weaknesses:** Regular updates of the global fishing vessel register will need to occur to keep the system updated. If global fishing vessel register does not have full coverage an option to manually add vessel details will need to be included.
External	**Opportunities:** Strengthens the case for the global fishing vessel register. Opportunity for other systems (e.g. MCS systems to use the same data source)	**Threats:** Global fishing vessel register needs to be completed and have full coverage. Global fishing vessel register will need to be updated.

5.1.3.6 Links to licensed vessel lists in 3rd countries

Similar to the single database of fishing vessels, a link to licensed vessel lists in third countries is also reccommended. This would require a database table of the third party country, licence identifiers and dates linked to the database of fishing vessels as a minimum and could also include gear, species and spatial restrictions along with quota information. This would require a high degree of cooperation and agreement with third countries to implement and a commitment to update data either automatically or manually. This is not an essential part of the system but would provide the benefit of being able to automatically check vessel licences against lists provided by RFMOs and coastal States of licensed vessels. This is the likely weakness in that the system would rely on data provided via the RFMOs and coastal States and that these data must be continually updated to ensure the functionality is of any value.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** All CCs will be able to be linked to a specific licence for a specific vessel from a database linked to the single unified global fishing vessel register. The CC system would therefore be able to use one single independent database source for vessels and licences verified by the flag States.	**Weaknesses:** Regular updates of the global fishing vessel register and licence register will need to occur to keep the system updated. If global fishing vessel register or licence register do not have full coverage an option to manually add licence details will need to be included.
External	**Opportunities:** Strengthens the case for the global fishing vessel and licence registers. Opportunity for other systems (e.g. MCS	**Threats:** Global fishing vessel and licence registers need to be completed, have full coverage be updated on a regular basis.

	Positive (Helpful)	Negative (Harmful)
	systems to use the same data source)	

5.1.3.7 Ensuring any electronic systems established are expandable and adaptable

The NGO Coalition recommended that any electronic systems that were established to allow CCs to be recorded and tracked should be expandable and adaptable. This is essential in ensuring that a system is implemented and continues to develop to meet the needs of Member States, the Commission and third party users.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** Allows for future development and expansion.	**Weaknesses:** Expandable and adaptable systems may be more expensive.
External	**Opportunities:** Future development time and expense is reduced.	**Threats:** None identified.

5.1.3.8 Combining modernisation process with outreach & capacity building in third countries

The NGO Coalition recommended that any modernisation process must be combined with outreach and capacity building in third countries. The introduction of the CC process was underpinned by a series of workshops held around the world to introduce the concepts and system of the CCs. Building on the success of this it is strongly recommended that a similar process occur for the proposed system in whatever form it takes to ensure buy-in and understanding of both TRACES and the electronic CCs system from third countries.

	Positive (Helpful)	Negative (Harmful)
Internal	**Strengths:** Increase uptake and data entry at source in third countries. Reduced administrative burden with EU MS CAs.	**Weaknesses:** Requires financial inputs to undertake training.
External	**Opportunities:** This requirement will allow the Commission to build upon current TRACES and catch certificate training to allow training for the system to be deployed to ensure the highest uptake of the system possible.	**Threats:** Countries do not wish to use the electronic system and a parallel paper based system requiring entry by EU MS CAs occurs.

5.2 How TRACES could meet catch certificate requirements

This analysis looks at a number of increasingly complex options for the development of TRACES to incorporate CCs and addresses where each of the requirements described would be met. The current core functionality of TRACES is the management of certificates, and in our judgement, TRACES is ideally place to be used as a centralised CC system.

TRACES is already in use across all of the EU and the EFTA countries. The core of the system is a central database that is able to handle certificates for both import and export of products, and digitally captures the information associated with the certificates. TRACES is also able to handle split consignments. When a consignment is split, the TRACES system copies the data for the original consignment to a new record which is linked internally to the original record. At the same time the original record is locked and cannot be replaced to ensure that data integrity is maintained i.e. the original record deleted leaving orphaned records. In this way a consignment can continue to be split a number of times, each having a link back up the chain to the original consignment record.

Currently, the path to be taken by DG MARE and DG SANTE in the future development of TRACES to handle electronic CCs is not clear. Four potential options have been presented here, only the most complex of the four (Option 1) meets the coalition's goals. The four options are as follows;

Option 1: Current TRACES system with all catch certificate data and additional external data modules – The current TRACES system as it is currently implemented with all catch certificate data recorded and an additional number of modules addressing all the required functionality.

Option 2: Current TRACES system with all catch certificate data – The current TRACES system as it is currently implemented with an additional module allowing all catch certificate data as described in Table 10 to be recorded.

Option 3: Current TRACES system with simple catch certificate data – The current TRACES system as it is currently implemented with an additional module allowing the basic catch certificate data as described in Table 10.

Option 4: Current TRACES system – The current TRACES system as it is currently implemented with no additional functionality.

5.2.1 Current TRACES System with all catch certificate data and additional modules

The recommended option uses the current TRACES system and a number of additional modules that would need to be added to TRACES. The additional modules recommended, along with the requirements that will be met in each would include (*inter alia*):

Module – Electronic capture of catch certificate data

- Common database;
- Connection to TRACES;
- Record of cancelled and rejected certificates;
- Individually numbered Catch Certificates;
- Include additional information on Catch Certificate;
- Better control of re-export / re-import for processing;
- Phasing out of the paper-based CC system entirely;
- Requiring effective tracking of product transformations along the supply chain into the EU; and
- Management of split consignments.

Module – Electronic capture of related information such as quotas and vessel lists

- Standardisation - Uniform rules and data, customs codes;

- Contact database for third countries;
- Link to CMMs, quotas etc.;
- Include information on IUU vessel, company and country lists and alerts (EU, U.S., RFMO, Interpol);
- Single database of fishing vessels; and
- Links to licensed vessel lists in 3rd countries.

Module - Data import / export to national systems (NB: May be a module per national system)

- Links to other 3rd country database systems to reduce time;
- Standardisation - Uniform rules and data, customs codes; and
- Interface with other systems.

Module - Risk analysis and assessment

- Support risk-based analysis;
- EU wide risk assessment process; and
- Mass balance at certificate level - Countdown for products entering EU.

Module - Reporting

- Use of system for generation of standard data requests to meet obligations;
- Use system to assist in Mutual Assistance Requests; and
- Central interface for rapid alerts.

Outside of modules

- Improved timeliness;
- Multi-language interface – removes communication barriers;
- 24/7 System access;
- Backup and Restore Facility;
- Ensuring any electronic systems established are expandable and adaptable; and
- Combining modernisation process with outreach & capacity building in third countries.

These additional modules will allow the required functionality to implement the CC process and to ensure the digital capture of all CC related information. Many of the additional functions will not be related to individual CCs but are related to the processes used in EU MS to manage CCs (e.g. risk analysis and assessment) and it is recommended that these would be in separate secure modules with access only to appropriate persons. This is the only option that would meet all of the coalition's goals.

5.2.2 Current TRACES System with all catch certificate data

The second option uses the TRACES system with a single additional module that records all the details of a CC as defined in Table 10, along with a scanned copy of the CC to allow checking at any time as defined above (Module – Electronic capture of catch certificate data). This option would meet some of the coalition's goals but not all.

5.2.3 Current TRACES System with simple catch certificate data

The third option uses the TRACES system with a single additional TRACES module that records the basic details of a CC that are required for the batch and consignment analysis as

defined in Table 10 (i.e. CC document ID – a unique key field for the catch certificate, species, product (and CN8 product code), estimated live weight, estimated landed weight and verified landed weight). All other CC data would not be recorded in the system, but would be captured as a scanned document so they could be checked at any time.

Module – Electronic capture of catch certificate data

- Common database;
- Connection to TRACES;
- Record of cancelled and rejected certificates;
- Individually numbered Catch Certificates; and
- Management of split consignments.

TRACES could in this way be used to establish a centralised database of critical CC data. Only these critical data would be stored in a database but this would allow, through the linking of a consignment to a CC, for batch and consignment records to be checked to ensure they were within the catch total recorded on a CC. As TRACES is already established in all Member States this should be simpler to implement than a brand new system, however most of the users of the system for CCs will be new to the system, so training will be required.

5.2.4 Current TRACES System

This final option defines which of the requirements would be met by the current TRACES system with no additional functionality. In this option, CCs would be recorded as scanned documents associated with a consignment. No CC data would be added to TRACES.

TRACES was designed to allow economic operators to enter information into the system directly. By capturing information electronically at the source, the flows of information can be improved, as the information is more likely to be accurate and can be utilised quicker, bringing benefits to the economic operators and the competent authorities. This concept is also being promoted by the WCO “Customs Single Window”. This WCO concept aims to provide a single entry pointy for traders to submit information to governments thereby reducing administrative time and duplication of effort. There are several “Single Window” initiatives being discussed and implemented globally but at the moment there are no clear standards or guidelines to work with. Customs authorities is increasingly being expected to participate in and take responsibility for Single Window implementations and therefore TRACES would be a likely starting point for any EU based “Single Window” solution.

However these benefits can only be realised where TRACES is being used in that country. Although TRACES is run by the European Commission’s Directorate-General for Health and Consumer Protection, it is utilised by authorities within the EU and abroad. To our knowledge, there are approximately 76 countries registered as using TRACES, including the 28 EU Member States. This includes 16 countries form Africa, 4 from Asia, 5 from Oceania and 12 from the Americas. The top 50 countries in terms of presenting CC’s to the EU are provided below, from those 50 countries those that use TRACES account for over 57% of all CC in the EU (Table 4). The biggest CC producing flag states not currently utilising TRACES, include China and Thailand.

The current CC system does not require the electronic submission of data, and this is likely to remain a significant barrier to the flow of information as paper certificates will still have to be handled. Options are presented below in section 5.4. TRACES can handle scanned certificates, but it will still require some of the information to be extracted from the scanned documents and entered into the system manually.

Table 7. Requirements against TRACES and levels of TRACES modifications.

Requirement	Essential (RED) \ Desirable (GREEN)	TRACES (Current)	TRACES + Simple CC data	TRACES + all CC data	TRACES + All CC data and additional modules
Decrease risk of IUU products entering EU market					
Create level playing field between (for both MS and EO)					
Common database					
Connection to TRACES					
Contact database for third countries					
Link to CMMs, quotas etc.					
Improved timeliness and data quality					
EU wide risk assessment process					
Multi-language interface – removes communication barriers					
Links to other 3rd country database systems to reduce time					
Better control of re-export / re-import for processing					
Use of system for generation of standard data requests to meet obligations					
Use system to assist in Mutual Assistance Requests					
Phasing out of the paper-based CC system entirely					
Requiring effective tracking of product transformations along the supply chain into the EU					
Central interface for rapid alerts					
Mass balance at certificate level - Countdown for products entering EU					
Management of split consignments					
Include additional information on Catch Certificate					
Record of cancelled and rejected certificates					
Individually numbered Catch Certificates					
Include information on IUU vessel, company and country lists and alerts (EU, U.S., RFMO, Interpol)					
Support risk-based analysis					
System access					
Backup and Restore Facility					
Standardisation - Uniform rules and data, customs codes		Partial	Partial		
Interface with other systems					
Single database of fishing vessels					
Links to licensed vessel lists in 3rd countries					
Ensuring any electronic systems established are expandable and adaptable					
Combining modernisation process with outreach & capacity building in third countries					

Table 8. Catch certificate system requirements and technical and operational issues required.

Requirement	Technical	Operational
Decrease risk of IUU products entering EU market	Prerequisites: Common database, Connection to TRACES and EU wide risk assessment. System implemented across all EU MS with EU wide risk assessment.	TRACES system used to monitor CC effectively.
Create level playing field between (for both MS and EO)	System implemented across all EU MS with EU wide risk assessment.	Effective training within MS and in third party countries (as importers differ to MS)
Common database	Definition and development of underlying data base tables.	Agreed formats between MS and Commission.
Connection to TRACES	Current web interface needs expanding or separate CC interface needs to be developed.	DG SANTE and DG MARE need to agree development timeframe and costs. 3rd Countries need to use TRACES.
Contact database for third countries	Contact management already in TRACES. System could expand on this or develop a new interface solely for CCs (simpler).	Contact information is kept up to date.
Link to CMMs, quotas etc.	Prerequisites : Common database and Connection to TRACES Additional database tables defined and developed for additional data. Additional modules developed to allow lookup of appropriate details based on criteria in the CC. This will be simple for a lookup for CMMs that will be updated annually (by most RFMOs). Quota tracking will be much more complex system if to be implemented real-time and only a basic total check would be possible at this time.	Relevant external information is kept up to date. Annual for CMMs when updated by the RFMO. Real-time updating for quotas may not be possible but a check against a running total for a single quota or by flag State may be possible for an annual quota (i.e. countdown quota) although it should be noted that not all product may necessarily enter the EU.[1]
Improved timeliness and data quality	Prerequisites : Common database and Connection to TRACES The systems will uses controls reference lists, and data quality controls such range and domain checking to reduce errors and so increase efficiency.	System requirements must be able to meet operational requirements given the number of simultaneous connections and number of transactions required each day. Users are appropriately trained in the uses of the systems
EU wide risk assessment process	Prerequisites : Common database and Connection to TRACES. S2S	Agreed process for an EU wide risk assessment.

[1] NB: It should be noted though that this would allow the interception of some over quota species such as the swordfish entering Spain from Vietnam in recent years. This was identified after the fact by the Spanish Authorities whilst investigating the imports but could have been stopped at the point of entry if such a system was available.

Requirement	Technical	Operational
	Additional database tables defined and developed for additional data. Additional module developed to allow EU wide risk assessment process to run. It may be necessary to define an export routine to generate results that can be used in national risk assessment systems i.e. using the results of the EU wide process at the national level (better if standardised across EU MS).	MS and DG MARE agree standard formats for outputs (report and data for national system).
Multi-language interface – removes communication barriers	Prerequisites: Common database and Connection to TRACES – All functionality is translated and implemented into the format used by TRACES to enable full multi-language interface.	Number and coverage of languages should be sufficient but composition of catch certificates may differ from customs and this should be checked.
Links to other 3rd country database systems to reduce time	Prerequisites : Common database and Connection to TRACES 3rd part systems have import / export routines to match the TRACES standard and use S2S where possible as a tool for interface with other systems.	EU MS and DG MARE agree on import and export standards to exchange data with MS systems. DG MARE agrees on export standards to import data from 3rd party systems.
Better control of re-export / re-import for processing	Prerequisites : Common database and Connection to TRACES	All re-export certificates must be logged in the new enhanced TRACES system. EU MS economic operators must use system to record any fish that are re-exported from the EU and potentially reimported to allow the exclusion of these CCs in double counting.
Use of system for generation of standard data requests to meet obligations	Prerequisites : Common database and Connection to TRACES Additional database tables defined and developed for additional data and logging of data requests / data provided. Additional module developed to allow management of data requests.	Agreement between all MS and the format of the reports.
Use system to assist in Mutual Assistance Requests	Prerequisites : Common database and Connection to TRACES Additional database tables defined and developed for additional data for MAR. Additional module developed to process MARs.	MAR may increase as a result of the system facilitating the process.
Phasing out of the paper-based CC system entirely	Need clear definition to ensure all paper based routines transferred over to paperless system. It will also require the adoption of electronic signatures to enable trust that the information in the system has been verified.	Legislation will need to change to require paperless system to be implemented.
Requiring effective tracking of	Prerequisites : Common database and	Conversion factors may not be

Requirement	Technical	Operational
product transformations along the supply chain into the EU	Connection to TRACES Additional database tables defined and developed for additional data relating to product transformations. Additional functionality developed to allow tracking along the supply chain. Data to be provided for mass balance.	available for all products that are in the system and so will have to be calculated. Will require additional data to be entered into the system.
Central interface for rapid alerts	Prerequisites : Common database and Connection to TRACES Additional module developed to process rapid alerts (may need tables to log alerts).	Alerts will need to have protocols created for how they are managed, such as who responds to them, and what action are required to cancel the alert.
Mass balance at certificate level - Countdown for products entering EU	Prerequisites : Common database and Connection to TRACES Additional module / functionality allowing mass balance at any point in time for a single catch certificate, i.e. log of sum of all entries under a CC.	If the volumes in the certificate are exhausted, then all MS will need to trace what has happed to any product that has previously been admitted, prior to the certificate being exhausted.
Management of split consignments	Prerequisites : Common database and Connection to TRACES Additional data tables to handle split The national systems for generating CC numbers will not need to change, a composite key will be generated In the CC system based on the country of origin (2 letter ISO code) and the original catch certificate number (i.e. a new unique key).	Requirement for each 3rd party State to implement a system of unique catch certificate numbers with the provision for splitting. e.g. 12 digit certificate number with the numbers designating any split consignment after this.
Include additional information on Catch Certificate	Prerequisites : Common database and Connection to TRACES Additional database tables defined and developed	Additional information will require additional data entry. Were possible the ouns for data entry can be placed on the EO. However some additional information may not be available to EO's such a VMS data.
Record of cancelled and rejected certificates	Prerequisites : Common database and Connection to TRACES Ensure status of catch certificates is included in database table and options to cancel and reject in functionality.	Groupings for similar rejected certificates will have to be determined, such as timescale, geographic area, and economic operators.
Individually numbered Catch Certificates	Prerequisites : Common database and Connection to TRACES New unique composite key generated for all incoming CCs.	Requirement for 3rd party States to generate a unique number for each catch certificate that can be used with the national identifier as a composite key in the EU catch certificate system.
Include information on IUU vessel, company and country lists and alerts (EU, U.S., RFMO, Interpol)	Prerequisites : Common database and Connection to TRACES Additional database tables defined and developed for additional data. Additional module developed to allow	Relevant external information is kept up to date.

Requirement	Technical	Operational
	lookup of appropriate details based on criteria in the CC.	
Support risk-based analysis	Prerequisites : Common database and Connection to TRACES Additional database tables defined and developed for additional data to support risk analysis. Additional module developed to conduct analysis.	The results of the risk analysis's will have to be kept under review to ensure that they are not producing skewed results, this will most likely need to be done centrally.
System access	TRACES is a 24/7 system	Economic operators require 24/7 system.
Backup and Restore Facility	Highly mission critical data systems. Will require regular backup and restore, mirrored systems and redundancy,	
Standardisation - Uniform rules and data, customs codes	Prerequisites : Common database Good database design will require good data rules. Creation and maintenance of synchronised data tables of species codes (e.g. ASFIS) and customs codes (CN8 codes). Updates to these code systems are provided on a regular basis online by their originators and an automatic update process should be defined.	EU MS, DG MARE and DG SANTE to agree on harmonised standard codes. Customs codes may prove to be a problem as there is no clear link between CN8 codes and the specific requirements of catch certificates to record to a species level, e.g.: yellowfin tuna as a species is recorded as YFT but in CN8 customs codes it is often mixed with skipjack tuna (SKJ) in a number of product forms. Many species are highly grouped.
Interface with other systems	Use of standard codes (as defined above) and existing modules such as S2S and the List Management System module or through the development of additional modules to exchange data with other systems. For example the system should be able to accept CC data already in electronic formats from existing EU MS CC systems and reciprocally should be able to export data in a standard format that EU MS CC systems can import data easily.	EU MS systems will need to provide an interface to export or import CC data to the defined standards. This will if implemented reduce administrative burden for those MS over the long-term.
Single database of fishing vessels	Prerequisites : Common database and Connection to TRACES Requires Global Fishing Vessel Register to exist and to be available in a suitable format	Access to Global Fishing Vessel Register available. Staff available to maintain the GFVR tables linked to the TRACES CC system.
Links to licensed vessel lists in 3rd countries	Prerequisites : Common database and Connection to TRACES Requires licensed vessel lists to exist and to be available in a suitable format	Access to licensed vessel lists available. Staff available to maintain the licensed vessel lists linked to the TRACES CC system.
Ensuring any electronic systems established are expandable and adaptable	Good design to allow expansion / adaptation	Funding available for development. Political will available in EU MS and DG MARE / DG SANTE.
Combining modernisation process with outreach & capacity building in third		Funding available. Political will available in EU and third countries.

Requirement	Technical	Operational
countries		

Table 9. Catch certificate data elements required for various analytical functions.

Catch Certificate Element		Required for Batch Analysis	Required for Consignment Analysis	Required for Risk Analysis
Document number				
1 Validating authority	Validating authority			
	Name			
	Address			
	Tel.			
	Fax			
2 Fishing vessel	Fishing vessel name			
	Flag – Home port and registration number			
	Callsign			
	IMO / Lloyd's number (if issued)			
	Fishing licence No.			
	Inmarsat No., Fax No. Tel No, Email address			
3 Product	Description of product			
	Type of processing authorised on board			
	Species			
	Product code			
	Catch area(s) and dates			
	Estimated live weight (kg)			
	Estimated weight to be landed (kg)			
	Verified landed weight (kg) (where appropriate)			
4 CMMs	References of applicable conservation and management measures			
5 Fishing vessel master	Name of master of fishing vessel – Signature - Seal			
6 Transhipment at sea	Name of master of fishing vessel			
	Signature and date			
	Transhipment date / area / position			
	Estimated weight (kg)			
	Master of receiving vessel			
	Signature			

Catch Certificate Element		Required for Batch Analysis	Required for Consignment Analysis	Required for Risk Analysis
	Vessel name			
	Callsign			
	IMO / Lloyd's number (if issued)			
7 Transhipment in port	Transhipment authorisation within a port area			
	Name			
	Authority			
	Signature			
	Address			
	Tel.			
	Port of landing			
	Date of landing			
	Seal (stamp)			
8 Exporter	Name and address of exporter			
	Signature			
	Date			
	Seal			
9 Flag State authority validation	Name / Title			
	Signature			
	Date			
	Seal (stamp)			
10 Transport details	(in Appendix)			
11 Importer	Importer declaration			
	Name and address of importer			
	Signature			
	Date			
	Seal			
	Product CN Code			
	Documents under Articles 14(1), (2) of Regulation EC No …./2008 / References			
12 Import Control Authority	Import control authority			
	Place			
	Importation authorised			
	Importation suspended			
	Verification requested – date			
	Customs declaration (if issued)			
	Customs declaration - Number			
	Customs declaration - Date			
	Customs declaration - Place			

5.3 Obstacles

There are a number of technical and administrative obstacles to the effective implementation of the overall electronic CC system.

5.3.1 Technical

5.3.1.1 Digitisation

Catch certificates are currently required under the Regulation to be paper documents, so any CC system will be required to handle these documents in some way even with an electronic system unless this is removed. In practice, this will be at the lowest level a scan of the document that can then be associated with a record in the CC system.

Where digitisation of the data is required, beyond the simple attachment of a CC as an electronic document, a number of options exist, dependent on the solution chosen. In all cases the CC number should be unique (see Section 5.1.2.6), and therefore used as an identifier in a system to link electronic record with a scan. The supporting documents in TRACES are also required to be available as a paper record, so it is essential that TRACES is capable of handling scanned documents.

Electronic scanning of paper documents increases the access to information that has been recorded, however it does not increase the usability of that information unless it can be captured and encoded. Optical character recognition (OCR) is the method of converting text in the images of scan (machine readable text) into appropriate data fields. OCR is most successful were the document being scanned has itself been created by a computer, the scan is of high quality (greater than 100dpi) and all the text within the document uses a small and consistent character set (e.g. just the base characters - the alphabet and the digits 0-9). Templates can also be used to increase the accuracy of scan so only the parts of document that are required are read. Unfortunately CCs often have characteristics that make them less that optimal for reading as OCR, these include:

- There are multiple formats of catch certificate (although all based on a single template);
- May not be computer generated;
- May included hand written text; and
- May include characters for different alphabets (e.g. the Cyrillic alphabet).

Given these limitations, the application of OCR technologies for the reading of CCs is likely to be limited. A better solution would be to encourage the creation of electronic systems.

In the chosen deployment scenario the majority of data entry for CCs will be completed by the exporters, validated by the originating State and where necessary by the importers on the EU side. This will reduce the administrative burden on EU MS.

A 100 % electronic system will be the eventual goal of a CC system (NGO Coalition requirement with 5-7 years). If all users of the system are using it electronically, the system will be more timely and efficient. One of the key hurdles to overcome is the replacement of signatures with digital signatures. TRACES currently has a project looking at how to implement a 100% electronic system, including the uses of electronic signatures. Implementation of an electronic CC system should use this functionality as applied to future versions of TRACES.

5.3.2 Administrative

Any changes to the CC system may require changes to the Council Decision (EC) No 1005/2008 – "establishing a Community system to prevent, deter and eliminate illegal, unreported and unregulated fishing" and the implementing arrangements in Commission Regulation (EC) No 1010/2009 "laying down detailed rules for the implementation of Council Regulation (EC) No 1005/2008 establishing a Community system to prevent, deter and eliminate illegal, unreported and unregulated fishing".

Bringing about changes to Council Decisions often takes a number of years and iterations in the development process. It may take years to simply bring in requirements to allow an electronic system to occur; prior to which, full-scale development requiring electronic CCs is unlikely to occur.

5.3.3 Political

The changes to the Council Decisions (EC) No 1005/2008 & No 1010/2009 may also have political obstacles as there may be reluctance on the part of a number of MS to change the decision and hence their systems as this will incur costs without a clear benefit to each individual MS.

5.4 Recommended Implementation Solutions

Three solutions for system implementation are presented below, and make the assumption that at a minimum the option of the current TRACES System with simple CC data is available to be implemented. A final implementation of the system is likely to require a mixture of solutions initially before moving to Solution 1 which is the completely electronic solution.

5.4.1 Solution 1 - Distributed Electronic System

In this solution the economic operators are creating in TRACES the consignment and the linking it to a CC. For it to be linked to a CC in TRACES, the details of the CCs will need to have been entered by the competent authority for generating CCs in an electronic format, and at least record the CC reference number, product codes, species and weights. When information is entered it will be transmitted to the central EU database of CCs. When the consignment reaches the border of the EU, BIP will then include as part of their checks in the TRACES system that the CC linked to the consignment has not been exhausted by reconciling the amounts in the consignment against the amount that were in the original CC, and the amounts of any previous consignments that have entered the EU. The processes and the stakeholder that will be responsible for them are shown in Figure 9.

Solution 1 is the only solution that would meet all of the coalition's goals (alongside Option 1).

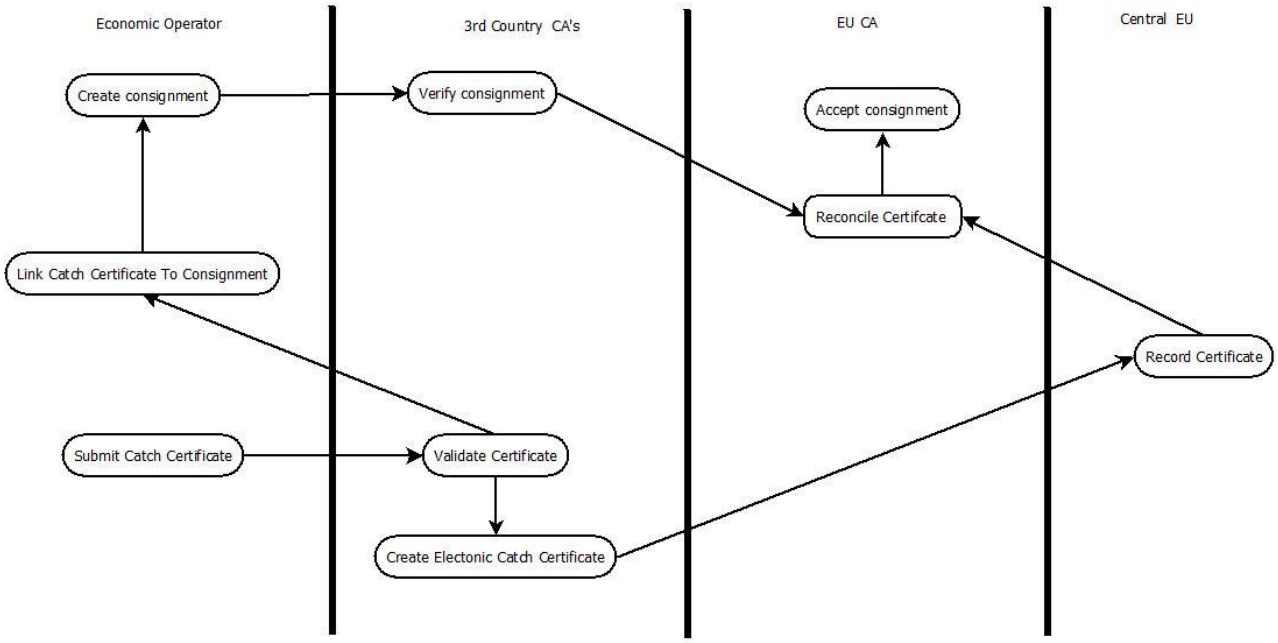

Figure 9. Process flow diagram showing process in Solution 1 and which stakeholders will be responsible for them.

Strengths

- The data is entered electronically close to the source of information, for both the consignments and the CC information. This will reduce the risk of transposition errors.
- The effort of entering data is distributed amongst all the users of the system, thereby reducing the administrative burden on EU MS as economic operators will be able to enter CC data themselves into the system.
- The compliance burden (i.e. the effort of complying with the regulatory requirements) will be higher for the economic operators but they will benefit as the processing of their consignments may be quicker. The compliance burden for EU MS will be lower as they will benefit from not needing to enter the base catch certificate data themselves and will be able to identify consignments prior to arrival as they will already be in the system. In this way EU MS will be able to identifying high risk consignments and can target their inspection resources more effectively and efficiently.
- Data on catch certificates will be centrally available as soon as they are created, enabling the weights in the catch certificates to be reconciled against consignments as soon as they enter the EU.

Weakness

- There is no compunction for economic operators or competent authorities for catch certificates to enter the data electronically.

5.4.2 Solution 2 - Electronic system in Third Country

Economic Operators may submit their CC and consignments information on paper systems to the relevant competent authority in their country. The CC information is entered into an electronic system, and validated and submitted to the central EU database for CCs. Consignments can be created in TRACES, and linked to the CC reference number. When

the consignment arrives at the EU border, the BIP can reconcile the amounts and weights in the consignment against the certificate, and any other consignments that have used that certificate, and if the amounts exceed the certificate the BIP can be alerted. The processes and the stakeholder that will be responsible for them are shown in Figure 10, manual process are shown in rectangles, electronic process are shown with curved edges.

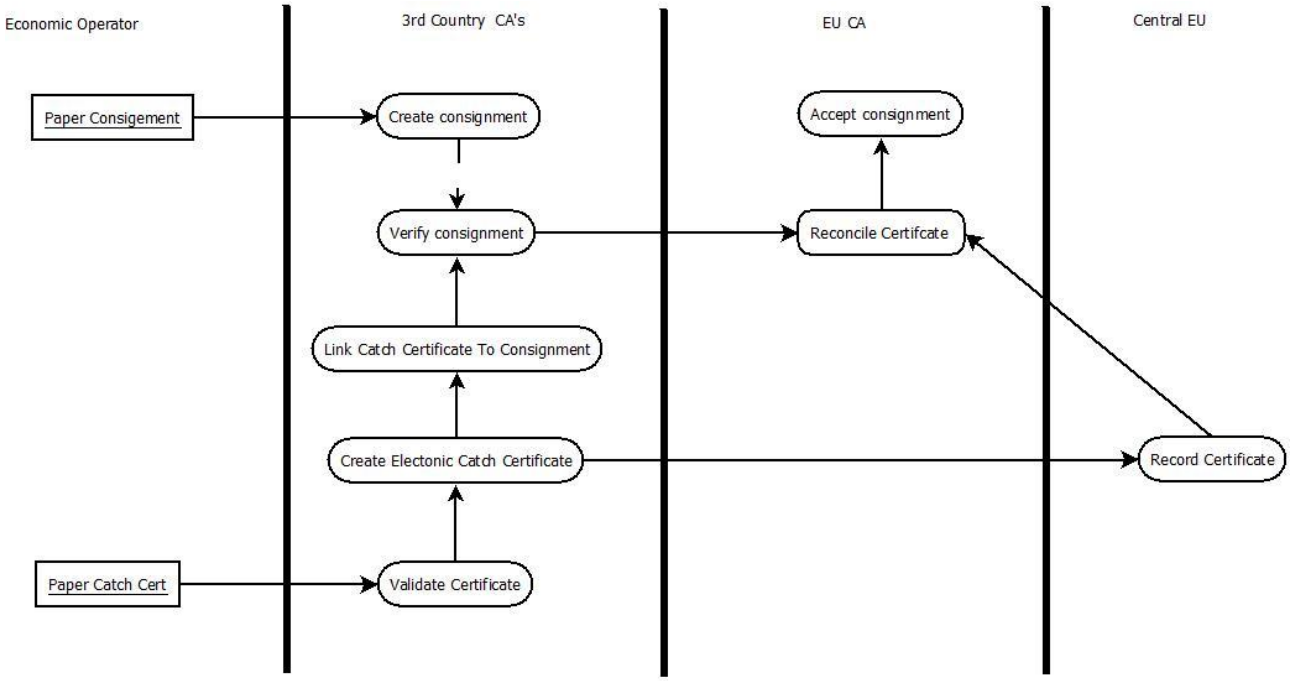

Figure 10. Process flow diagram showing process in solution 2 and which stakeholders will be responsible for them.

Strengths

- Data is capture closer to the source,
- The effort in entering data is more distributed between 3rd countries and EU,
- Data on the catch certificates will be available sooner and to more people.

Weakness

- Relies on third countries signing up to using the system,
- The competent authority for catch certificates and TRACES in third countries may not be the same.

5.4.3 Solution 3 - Electronic System at EU Border

Paper consignments and paper CCs are created by the competent authorities in third countries (N.B. The CA for a consignment may well be different to the CA for a CC). The CC should be sent to the competent authority for the CCs who will enter the CC reference into the electronic system, if it is the first time that the certificate has been used it will then be prompted to enter all the required information and then submit that information to the central database.

The paper documentation are sent along with the physical consignment, and will be inspected at the border. The BIP will then enter the information from all the paper documentation on the consignment into TRACES, including the CC reference number. The reference can be checked against the central database of certificates and the weights the

consignment reconciled against it, along with any previous consignments that have used that CC and if the total weights of the consignments exceeds the catch certificate, the BIP can be alerted. The processes and the stakeholder that will be responsible for them are shown in Figure 11, manual process are shown in rectangles, electronic process are shown with curved edges

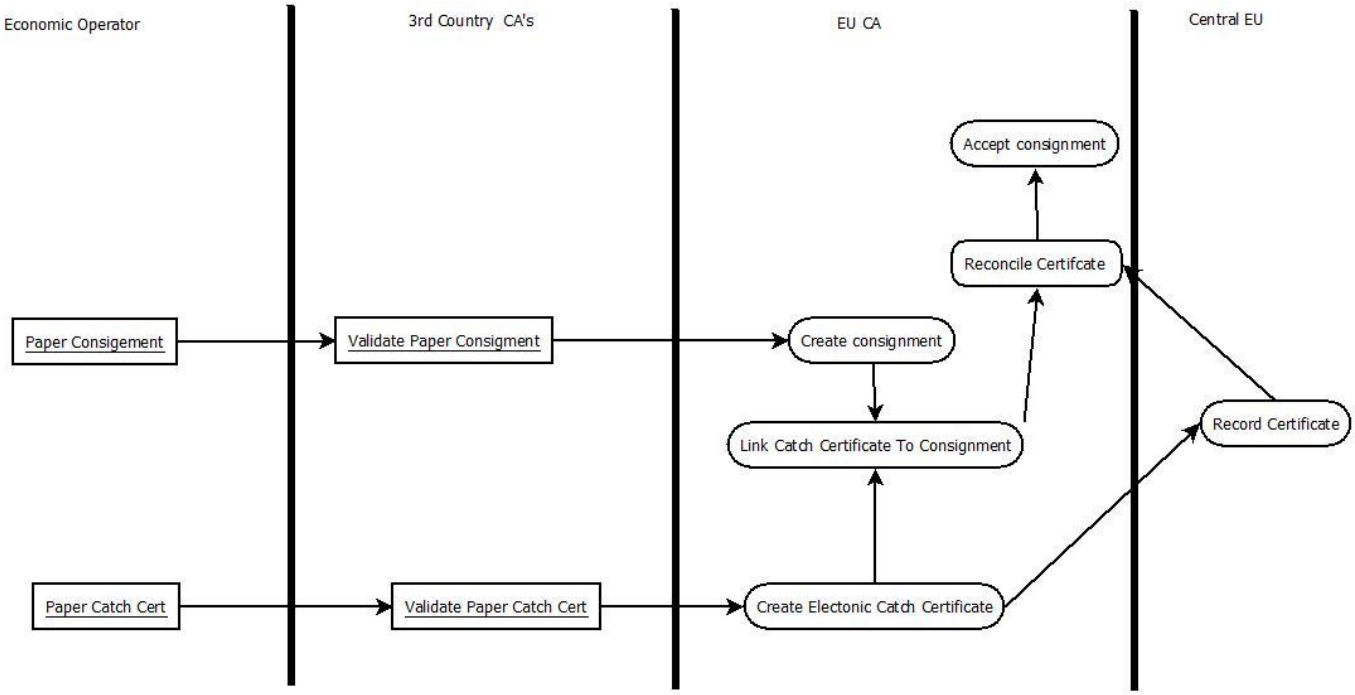

Figure 11. Process flow diagram showing process in solution 3 and which stakeholders will be responsible for them.

Strengths

- The system enable imports to continue from countries not using the TRACES system, and still using paper certificates.

Weakness

- The BIP at the EU border will have their work load increased by having to complete more checks, and having to do more data entry,
- The catch certificate component authority will have their work load increased by having to do more data entry,
- The data in the system will not be as timely, as certificates will only enter the system when they first appear on the border of the EU with a consignment.

5.5 Conclusions on TRACES

TRACES is a well-established system for managing certificates for import and export that is currently operating in all EU and EFTA countries, as well as a large number of third countries. Most of the existing users of TRACES that responded said that it worked well, and in the case of Switzerland they have even trialled using the existing system to manage CCs. The analysis of the functionality of TRACES shows that many of its functions, at least partially, meet the system requirements of a CC system with a few additional functions or modules. For TRACES to be used it will require at least additional information on the

species, products and weights of imports to be incorporated, and agreement that it will be used by all the EU MS for CCs.

Many of the other functions in TRACES such as the consistency checks, checklist, "Help To Decision" tool, work flow management, notification and messaging system, risk assessments tools, system to system interface, reference lists could all contribute to a comprehensive CC system. Some functions such as the reference lists will be available to use immediately or with just minor changes. However the more advanced risk assessment functions such as the decision models are likely to need significant development, and require specialist knowledge that may not be available the current developers of the TRACES, but their experience in implementing similar functions (such as the development of a mutual assistance notification system that could be considered an equivalent to the RASFF) in the current TRACES will be invaluable.

6 Recommendations

The following recommendations are a summary of what would be required to create a CC system that would reduce the risk of IUU fish entering the EU system:

Table 10. Catch certificate system requirements and recommendations for appropriate solutions.

Requirement	Recommendations for solutions
Decrease risk of IUU products entering EU market	It is recommended that an enhanced TRACES system is implemented allowing checks to be made in real-time against any incoming catch certificate to check validity and running total of product imported using this catch certificate,
Create level playing field between (for both MS and EO)	It is recommended that the enhanced TRACES system is employed across the EU so that all MS have the same ability to check imported product against records. This will reduce the opportunity for importers to find a weakness in the EU border that can be exploited to import IUU fish.
Common database	It is recommended that a single online database is used for this purpose (possibly a distributed system to allow for redundancy), accessed through an enhanced TRACES system is used across the EU to provide up to date information to all MS users.
Connection to TRACES	It is recommended that the functionality described in this document is built upon the current TRACES system through a system of additional modules.
Contact database for third countries	It is recommended that contact information (name, address, phone, fax and email) for all importers, exporters, MS officials and competent authorities is provided via the existing LMS module of TRACES. This will be a single interface where all contact information can be updated and available to all users.
Link to CMMs, quotas etc.	It is recommended that within the enhanced TRACES system that a database of relevant conservation and management measures (including quota information) is developed as an additional modules to an enhanced TRACES system. The database would be accessible online and searchable to find all CMMs relevant to a species and area for a given year. It is recommended that a simple check against the total quota allocation (simple quota or national quotas within an RFMO) should be implemented. This would only be able to check if the imports compared to the total quota had been reached, and not perform and a simple countdown. More complex checks on bycatch etc. could not be performed.
Improved timeliness and data quality	It is recommended that The catch certificate system will be developed as an additional module to TRACES. TRACES is a 24/7 system and will therefore be available to use both for commercial enterprises (importers / exporters) to enter data on catch certificates into the system but also for the relevant competent authorities in EU MS to query the system to check the status of any catch certificates encountered at the EU border. This proposed mechanism is similar to that currently used by CCAMLR for the eCDS (electronic catch documentation system) for toothfish. It is recommended that the validation could be improved to provide a quality assessment of the validation competent authority identifying which checks have been conducted as part of the validation e.g. physical inspection of the catch, VMS, AIS and logbook records. Those catches for instance validated by a third country remotely for a vessel catching and landing fish in another State's ports with no visual inspection only a check of VMS records for the period when the catches were made would probably have a higher level of risk than a catch certificate where the third country has inspected a local vessel landing fish, checking its VMS and logbooks and then being able to validate based on all this information.

Requirement	Recommendations for solutions
	These process will be technically and operationally feasible through a TRACES add-on module for data entry / editing of certificates where 3rd country validation is part of the entry process.
EU wide risk assessment process	The proposed enhanced TRACES system will enable an EU wide risk assessment process to be conducted with the process in a secure additional module to TRACES. It is recommended that in an automated system should be implemented through TRACES to check the contents of the data fields on the catch certificate relating to the named individuals (creator, master of the fishing vessel, master of the receiving vessel, exporter and importer) and the fishing vessel and its flag. These data can be checked automatically at submission against reference data sources including authorised (white) or non-authorised (black) lists. EU wide information on refused shipments (and their catch certificate source information) plus information from catch certificate information based on data from importers, exporters and the EU border where catch certificates have been checked can all feed into such a process. A process for an EU wide risk assessment will need to be agreed in advance of development of any analysis / assessment module. EU MS and DG MARE will need to agree standardised formats for outputs (report and data for national system) to enable the system to function with existing national systems.
Multi-language interface – removes communication barriers	The proposed additional modules should use the same system as the current TRACES system to allow a multi-language interface. The number and coverage of languages may need to increase dependent on the composition of catch certificates and where these catch certificates are input into the system. Where possible it is recommended that additional languages are added to cover important countries so that catch certificate data are entered by the exporters and if this is not possible then data can be entered by the importer.
Links to other 3rd country database systems to reduce time	It is recommended that the EU MS and DG MARE agree on import and export standards to exchange data with MS systems. It is also recommended that DG MARE agrees on a set of export standards to allow the importation of data from 3rd party systems e.g. a single CC standard in XML that can be generated by a 3rd party system, submitted to the database through a secure login and is then able to be read directly into the system without manual data entry.
Better control of re-export / re-import for processing	It is recommended that the system becomes the sole mechanism for recording the re-export and import of fish from the EU. All EU MS economic operators must therefore use this system.
Use of system for generation of standard data requests to meet obligations	It is recommended that an agreement is made by all MS and DG MARE on the format of the reports for standard data requests to meet obligations. These data can then be extracted in the standard format for submission to the Commission or other data users. This will save time and expense in the long-term.
Use system to assist in Mutual Assistance Requests	It is recommended that the enhanced TRACES system can be used to facilitate “Mutual Assistance Requests”. Where an investigation is started relating to a particular catch certificate then the necessary documentation can be prepared from the system in a standard format. Regulation 1008/2005 calls for a systematic and automated administrative cooperation and exchange of information concerning potential and detected IUU fishing activities. An IUU Fishing Information System, is to have been set up and managed by the European Commission (or a body designated by it) to assist authorities in EU Member States and third countries in preventing, investigating and prosecuting IUU fishing activities. It is recommended that the enhanced TRACES should be able to feed information directly into this system.
Phasing out of the paper-based CC system entirely	It is recommended that the NGO coalition propose that legislation is developed to require that a paperless system (based on the TRACES system) is implemented. The next generation of the TRACES system is

Requirement	Recommendations for solutions
	expected to include electronic signatures, that will be a will be necessary to replace paper signatures and stamps.
Requiring effective tracking of product transformations along the supply chain into the EU	It is recommended that the system be able to record conversion factors as calculated from catch certificates as these may not be available for all products that are in the system and so will have to be calculated based on data received. This may require additional data to be entered into the system. It is recommended that these data are used as part of the risk assessment process as poor recording of conversion factor data is a potential method for importing IUU catch into the EU, either as underreporting actual catch or misreporting products as other species or products.
Central interface for rapid alerts	It is recommended that the enhanced TRACES system can be used to facilitate "rapid alerts". A set of protocols will need to be created for how rapid alerts are managed and the data and report formats that the TRACES system will need to export to assist the creation of rapid alerts.
Mass balance at certificate level - Countdown for products entering EU	It is recommended that the enhanced TRACES system can provide a mass balance for a single certificate. This will allow, if the volumes in the certificate are used over the amount declared on the certificate the system will notify the current user. The system should then report this to all MS that have imported catch on this suspect catch certificate and they will need to trace what has then happened to any product that has been imported prior to the certificate being exhausted. A process for resolution of these differences will need to be developed for both users and internally within the system. NB: The later catches may be legal, and it may be the earlier catches that are not.
Management of split consignments	It is recommended that a standard numbering system is used by each originating country with provision for additional numbers or identifiers after the standard CC number to define splits in the consignment (e.g. -01 -02 or –A –B).
Include additional information on or related to Catch Certificates	It is recommended that additional information should be added above and beyond the basic data of the catch certificate. This will require additional data entry and it is recommended where possible that the ouns for data entry can be placed on the Economic Operators (importer or exporter). However it should be noted that some additional information may not be available to EO's such a VMS data and that these data may need to be securely handled outside of the TRACES system with just an approval marker and digital signature to show that the data have been verified. Where it's not possible to enter additional information into the enhanced TRACES system additional documents could be "attached" i.e. uploaded to sit alongside the catch certificate could be used. These could be quota management documents showing catches taken from a legal fishery from a quota allocated to the vessel named on the certificate, confirmation of logbook records from the validating flag State or any additional notes pertaining to a particular catch certificate. Feasible within the current TRACES system although would be ideally more structured for CCs.
Record of cancelled and rejected certificates	It is recommended that any enhanced TRACES system to monitor catch certificates should be able to identify simply the status of a catch certificate [open; complete; cancelled; rejected; other]. It is recommended that these data are used in the risk assessment processes (EU wide and national) and risk factors based on species, timescale, geographic area, and economic operator are identified.
Individually numbered Catch Certificates	It is recommended that the in addition to the unique catch certificate numbers from the originating country a composite key is defined internally based on the originating country and the catch certificate number. In this way all catch certificates from all originating countries will be unique and recorded as such in the system.
Include information on IUU vessel, company and country lists and alerts (EU, U.S., RFMO, Interpol)	It is recommended that access is permitted in the system to relevant external information such as a combined IUU vessel list, authorised vessel lists (merged with the global fishing vessel register when complete) and any external alerts (e.g. Interpol purple notices). This information will require administration to ensure that it is kept up to date.

Requirement	Recommendations for solutions
Support risk-based analysis	It is recommended that the system should be able to produce outputs that can assists national authorities within the EU in their risk based analysis and assessment. This may require the development of standards by MS to produce a common output format that they can all use.
System access	It is recommended that the systems should have 24/7 access. Economic operators require this due to the global reach of exports to the European Union and the 24/7 nature of fish processing. The current TRACES system has 24/7 hours access already and it is recommended that any additional modules in an enhance TRACES system should maintain this level of access.
Backup and Restore Facility	It is recommended that in line with best practice for all live systems that particular attention to transaction logging and mirroring of databases is implemented to ensure no data is lost from the system.
Standardisation - Uniform rules and data, customs codes	It is recommended that prior to the development of any enhanced TRACES system that EU MS, DG MARE and DG SANTE agree on harmonised standard code systems. The issue of customs codes may prove to be a problem where they are not provided to the level of species aggregation applicable to catch certificates.
Interface with other systems	It is recommended that an enhanced TRACES system able to manage catch certificates across the European Union should be able to interface i.e. exchange data both as a donor and recipient as required. The system specifications should be made available to other developers to allow additional modules to be developed to export data to national systems or import data from those systems.
Single database of fishing vessels	It is recommended that when available the catch certificate database should maintain a constantly updated link to the Global Fishing Vessel Register. This will require staff available to maintain the GFVR tables linked to the TRACES CC system.
Links to licensed vessel lists in 3rd countries	It is recommended that when available the catch certificate database should maintain a link to available licensed vessel lists. Staff will need to be available to maintain the licensed vessel lists linked to the TRACES CC system.
Ensuring any electronic systems established are expandable and adaptable	It is recommended that the underlying models and documentation used to develop the enhanced TRACES system are open to the public to allow 3rd party development of additional tools related to the system. It is also recommended that open source technology is used where available to reduce costs and ensure systems are expandable and adaptable.
Combining modernisation process with outreach & capacity building in third countries	It is recommended that the process of updating TRACES to include catch certificates is combined with an outreach process and capacity building in third countries to ensure the uptake and continued use of the enhanced TRACES system.

Table 11. Gaps Identified in the current catch certificate systems and TRACES

Gap	Recommendation
GAP-Current TRACES users are not necessarily involved in CC management	At the moment there are two clear groups of users, TRACES and catch certificate managers. Neither is fully aware of the other group's requirements and systems. It is recommended that EU MS are encouraged to bring these parties together as part of any development process to enable each group to better understand the other.
Gap – paper certificates will still have to be incorporated into system	Until the regulation is changed, paper based certificates will still be required to be created and pass through the system. An electronic system running alongside this will assist in the speed and efficiency of the system but a truly electronic system will not be fully effective until the regulation is changed.
GAP-Many 3rd countries do not use TRACES	A significant gap is that many 3rd countries currently do not use TRACES. It is recommended that TRACES outreach be employed to encourage the uptake and highlighting the benefits of TRACES (and when appropriate a combined TRACES / CC system).

Gap	Recommendation
Gap –Capacity of 3rd countries to uses systems.	Even when 3rd countries are using TRACES, the level of engagement in using the current systems is highly variable, and new system would require promotion and training initiatives such as the road shows undertaken within the IUU regulation, or the current TRACES Training program.
GAP-an single database of fishing vessels, Transparent licence list	Currently no single global record of fishing vessels exists. It is recommended that NGOs and EU MS support the FAO Global Record of Fishing Vessels to act as a standard single source for this information. Similarly, fishing licence data is not available from all coastal States or RFMOs. It is recommended that NGOs support and encourage coastal States and RFMOs to make this information available and transparent. These data sources could then be linked to a TRACES add-on that enables EU MS to verify vessel and licence data automatically for incoming CCs.