numerous measures that states may enact outside the PSSA regime and without prior approval by IMO. Examples include accident-management systems together with the allocation of sufficient tug capacity, as well as adequate ports of refuge.[252] It is my contention that where additional measures are necessary for protecting the area sufficiently from shipping threats, the acknowledgment of *particular sensitivity* places an obligation on the applying state to ensure that these measures are implemented. Otherwise, the applicant would contradict its conduct in the process of seeking PSSA status within IMO.

IV. Concluding Remarks

It has obviously taken the PSSA concept more than two decades to emerge in full force on the international policy level. From the first diplomatic initiatives in 1978 to recent revisions in late 2005, changes have not been dramatic; however, states seem to be increasingly aware of the potential impact a PSSA designation might have. This development is arguably stimulated by the fact that marine areas only have to meet one of the many PSSA criteria in order to qualify for designation. Nevertheless, PSSA designations follow an elaborate procedure, in which many organs of IMO are involved.

Even though charting standards have only recently been finalised within IHO, some have argued that PSSAs elevate the level of protection for an area by highlighting its significant ecological value to mariners navigating in the area. While these effects may arguably occur, it must be seen whether states in the future rely more on the establishment of precautionary areas to achieve these ends. Whatever the outcome of this development will be, APMs remain the key elements for the protection of PSSAs. The following chapter is thus devoted to an in-depth analysis of measures that may employed to protect sensitive areas identified by MEPC.

Chapter 8: Associated Protective Measures as the Essential Part of a PSSA

The previous chapter has already identified Associated Protective Measures (APMs) as the core feature of every PSSA. APMs define the means by and the extent to which a PSSA is protected against environmental threats posed by inter-

[252] For an excellent survey of the last issue, see Inken von Gadow-Stephani, *Der Zugang zu Nothäfen und sonstigen Notliegeplätzen für Schiffe in Seenot* (Berlin Heidelberg: Springer 2006), p. 70 et seqq. She demonstrates that coastal states are under the obligation to provide ports of refuge by virtue of Art. 192 and 194(1) of UNCLOS, as well as by virtue of customary obligations to prevent cross-border harm to the environment (*sic utere ut alienum non laedas*). What can be drawn from that is that if an area in which a vessel has come into distress is designated as a PSSA, coastal states are under an even greater obligation to provide adequate places of refuge.

national shipping. The present chapter examines the provisions of the PSSA Guidelines dealing with APM requirements, as well as their relationship with relevant UNCLOS provisions on the coastal-state regulation of vessel-source pollution. I shall first outline the range of measures available for adoption by IMO and the legal requirements they have to conform to. Secondly, I shall illustrate how IMO assesses APM proposals and how they are enforced once implemented in an area. In the final section, I will try to summarise the implications of the PSSA concept by highlighting similarities and differences of all PSSAs designated so far. To that end, I will focus on APMs that have been approved by IMO for each of the areas.

I. Protective Measures Pursuant to the PSSA Guidelines

It has become apparent so far that the designation of a PSSA does not automatically provide for protective measures. In addition to the designation, IMO needs to approve APMs to be implemented jointly under the PSSA roof for the whole or parts of the area. Despite a possibly precautionary effect of a PSSA designation as such, the concept would be futile without accompanying instruments constraining dangerous shipping activities.

Two different sections of the PSSA Guidelines, paragraph 7.5.3 and 6.1, include details on the kind of measures that may be adopted. While paragraph 7.5.3 in a more abstract manner dwells upon the legal instruments deployed for APMs, paragraphs 6.1.1 to 6.1.3, by setting forth a non-exhaustive list of options, illustrate the range of protective measures available for IMO to protect PSSAs.

1. Legal Bases: Paragraph 7.5.3 of the PSSA Guidelines

The guidelines include an essential qualifier for measures contemplated for protection of PSSAs. As a central criterion they require every APM to have an identified legal basis. Paragraph 7.5.3 of the PSSA Guidelines lists three options, whose implications shall be scrutinised in the following section. It provides for

> "(i) any measure that is already available under an existing IMO instrument; or
> (ii) any measure that does not yet exist but could become available through amendment of an IMO instrument or adoption of a new IMO instrument. The legal basis for any such measure would only be available after the IMO instrument was amended or adopted, as appropriate; or
> (iii) any measure proposed for adoption in the territorial sea, or pursuant to Article 211(6) of the United Nations Convention on the Law of the Sea where existing measures or a generally applicable measure (as set forth in subparagraph (ii) above) would not adequately address the particularized need of the proposed area."

a) Section (i) and (ii)

The first option does not require any interpretation; it obviously allows for all measures under both soft-law and treaty instruments. Examples include the

approval of SOLAS vessel traffic systems or COLREG traffic separation schemes. Paragraph 7.5.3(ii) supplements the first option, inasmuch as it permits the approval of APMs for which no legal bases exist. In such a case, a proposed APM may not be rejected solely on the grounds that it has no legal basis. But proposing governments are obliged to submit an application to amend or create the necessary instrument. Approval or rejection of the APM is pending until the completion of that process. The wording of Section (ii) was changed during the 2005 review of the guidelines. In the 2001 guidelines, it allowed for "any measure that does not yet exist but that should be available as a generally applicable measure and that falls within the competence of IMO." Apparently, the previous wording did not expressly require an existing instrument, as long as the measure was generally applicable, i.e. accepted for global use. It is questionable whether the current text has dramatically changed prerequisites for APMs, apart from requiring proposing governments to draw up in addition a proposal for an instrument that allows for the enactment of a particular protective measure. It is not inconceivable that MEPC or any other organ of IMO may, at the same session, approve an APM, as well as the instrument providing for its legal basis.[253] In essence, Section (ii) clarifies that an APM may well be approved even though its legal basis is included in an instrument that is pending approval. However, it can only take effect *as an APM for a specific PSSA* after the instrument that it is based on has come into existence.

b) Section (iii)

Section (iii) probably contains the most controversial provision that arguably allows, in turn, for the most flexibility.[254] As it refers to measures that may be maintained by coastal states under Articles 21 and 211(6) of UNCLOS, it should be recalled what was outlined in Chapter 4 above. With respect to its territorial

[253] Furthermore, the wording of Section (ii) arguably permits IMO approval of an APM if the respective legal instrument is still under discussion. Implementation and enforcement of the protective measure could be delayed until the soft-law instrument or treaty takes effect.

[254] "This section contains as yet unused authority for coastal States to adopt with IMO approval special mandatory measures that go beyond existing IMO measures. [… T]his third category may prove to be a vital outlet for the otherwise growing frustration of coastal States over UNCLOS' limitations on coastal State jurisdiction." Statement by Kristina M. Gjerde, "Protecting Particularly Sensitive Sea Areas From Shipping: A Review of IMO's New PSSA Guidelines", in H. Thiel and J.A. Koslow (eds.), *Managing Risks to Biodiversity and the Environment on the High Sea, Including Tools such as Marine Protected Areas – Scientific Requirements and Legal Aspects* (Bonn-Bad Godesberg: BfN-Skripten 2001), pp. 123-131, at 126. Likewise, in contemplating Section (iii), Angelo Merialdi, "Legal Restraints on Navigation in Marine Specially Protected Areas", in T. Scovazzi (ed.), *Marine Specially Protected Areas* (The Hague Boston London: Kluwer Law International 1999), pp. 29-43, at 37, notes: "In fact the establishment of a PSSA could represent a remedy for the limits set by international law regarding the application by coastal States of anti-pollution standards which have not received general acceptance".

sea, a coastal state is given the power, by virtue of Article 21(1) and (2), to subject foreign vessels to laws and regulations relating to, *inter alia*, the "safety of navigation and the regulation of maritime traffic," as well as "the preservation of the environment of the coastal state and the prevention, reduction and control of pollution thereof," as long as these rules do not give effect to CDEM standards other than those giving effect to generally accepted international rules and standards. In contrast, the EEZ regime empowers coastal states to legislate for their respective zones with regard to "the protection and preservation of the marine environment," but obliges them to "act in a manner compatible with the provisions of this Convention."[255] Relevant provisions are to be found in Part XII, namely Article 211(5) and (6). Coastal states are usually restricted to enacting regulations based on generally accepted international rules and standards.[256] Where these standards are inadequate for responding to the specific circumstances of an area, coastal states may, with the approval of IMO, introduce more stringent measures pursuant to Article 211(6). Its reference to "laws and regulations for the prevention, reduction and control of pollution from vessels implementing such international rules and standards or navigational practices as are made applicable, through the organization, for special areas" does not only provide for MARPOL special area discharge restrictions, but may also relate to specific navigational aids and even to rules on CDEM standards.[257] Further regulations adopted in accordance with Article 211(6) lit. (c), also subject to approval by IMO, "may relate to discharges or navigational practices but shall not require foreign vessels to observe [CDEM] standards other than generally accepted international rules and standards." At least as far as legislative competence is concerned, the EEZ regime in UNCLOS special areas thus resembles the territorial sea regime. However, while Article 211(6) is confined to the prevention of pollution from vessels, Article 21(1) and (2), in a more general manner, also deals with rules relating to "the preservation of the environment of the coastal state."[258]

This is the background against which the significance of Section (iii) must be understood, in particular because the PSSA regime employs an inter-zonal approach. In theory, every PSSA – regardless of the maritime zone it covers – may therefore be protected by measures that states are normally only allowed to adopt for application in their territorial sea or in special areas of their EEZ. The relevant provisions, in particular Article 211(6), thereby appear to have the characteristics of a toolbox.[259] If a coastal state considers it necessary to implement a specific protective measure, this measure need not have a legal basis in an existing instrument. If coastal states were allowed to adopt the measure in their territorial sea or in special areas of their EEZ, this specific APM would have a valid legal

[255] Cf. Art. 56(1)(b)(iii) and (2) of UNCLOS.
[256] Art. 211(5). For a definition of this term, see, *supra*, Sec. III.4. of Chapter 4.
[257] See, *supra*, Sec. III.3. of Chapter 4.
[258] Art. 21(1) lit. (f).
[259] Similarly, Lynda M. Warren and Mark W. Wallace, *supra*, note 233, pp. 523-534, at 534, contend that Art. 211(6) could be "interpreted so as to provide a flexible basis for identification and protection of specified areas." See further comments by WWF in MEPC 52/8/4, *supra*, note 154, p. 3, in note 1.

basis in terms of the PSSA Guidelines. The legal bases mentioned in Section (iii) of paragraph 7.5.3 of the PSSA Guidelines do not confine APMs to the respective maritime zone, neither to the territorial sea nor to the EEZ. Two arguments support this assumption. First, the chapeau of paragraph 7.5.3 does not include any limitation. Secondly, Section (iii) provides for instruments where measures under (i) or (ii) do not "adequately address the particular need *of the proposed area*" (italic emphasis added). The last phrase signifies that the legal bases for APMs apply to the whole area, not just to one part of it. This reasoning is in line with the holistic approach of the PSSA concept, that seeks to decouple protection of the marine environment from the rather artificial zonal approach deployed by UNCLOS.

In this respect, it should be borne in mind that PSSAs can cover straits used for international navigation and archipelagic waters whose passage regimes only allow for very limited coastal-state activities with respect to protective measures.[260] Hence, two safeguards have to be taken into consideration when contemplating the proposal of an APM. First, it is important to note that the first phrase of section (iii) is referenced by a footnote that reads: "This provision does not derogate from the rights and duties of coastal States in the territorial sea as provided for in the United Nations Convention on the Law of the Sea." The rationale for its inclusion is readily visible. It aims to clarify that for APMs proposed for application in a PSSA, the whole UNCLOS regime for the territorial sea must be taken account of, e.g. limits concerning CDEM standards, even if it is relied upon for the adoption of an APM in another jurisdictional zone. Secondly, and more importantly for legal disputes that might occur in straits or archipelagos[261], recourse must be made to the overriding law of the sea framework, since the PSSA Guidelines are "to be implemented in accordance with international law."[262] With respect to transit passage and ASL passage, it must be noted that UNCLOS leaves very little room for the introduction of mandatory APMs. Each proposed measure must be examined very carefully to ensure that it does not violate the passage rights of foreign vessels as reflected in UNCLOS.

In a nutshell, Section (iii) allows proposing states, in the process of identifying adequate APMs, to choose from measures available in the territorial sea or in the EEZ according to Article 211(6) of UNCLOS respectively. In a second step, it must be investigated whether the APM can be established in the respective maritime zone without violating the UNCLOS framework. This interpretation of the PSSA Guidelines' approach is corroborated by state practice within IMO.[263]

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[260] Cf. Sec. III.2.d) and e) of Chapter 4.

[261] For the recent dispute about the extension of the Great Barrier Reef PSSA to the Torres Strait, see, *infra*, Sec. II.1.d) of this Chapter.

[262] Fifth recital of the PSSA Guidelines.

[263] Australia and Papua New Guinea, in arguing for the introduction of compulsory pilotage in the proposed Torres Strait PSSA, first noted that compulsory pilotage is available as a measure under Art. 211(6) lit. (c) and, secondly, examined its lawfulness against the requirements set out by Art. 39 et seqq. See NAV 50/3, *supra*, note 150, para. 5.10.

2. Preliminary Findings

While Sections (i) and (ii) refer to protective measures that have or will have either a legal basis in a treaty or in an IMO instrument, Section (iii) considerably expands the scope for potential APMs. It provides for the opportunity to identify measures that specifically address the protective needs of the respective area. Moreover, Section (iii) in effect contributes significantly to levelling the differences between the regimes traditionally envisaged for the EEZ and the territorial sea to facilitate the uniform application of protective measures. The PSSA mechanism thereby promotes the application of an ecosystem approach, enabling the *prima facie* determination of the type of APM with a view to the specific needs of the area rather than to the allocation of jurisdiction. However, APMs must conform to the balance of jurisdiction introduced by UNCLOS.

Apparently, the issue of coastal-state jurisdiction over vessel-source pollution is important for the implementation and enforcement of APMs in PSSAs. Thus, after exploring the types of measures available as APMs in the ensuing section of this chapter, it is indispensable for me to come back to this issue at a later stage – it must be examined to what extent the PSSA Guidelines impact on coastal-state legislative and enforcement jurisdiction under UNCLOS. This statement does not conflict with what was said above: while APMs must not contradict the UNCLOS framework, they may change the allocation of rights and duties *within* that framework. Because this is a matter closely related to the legal quality of the PSSA Guidelines and the APMs, it is addressed, *infra*, in Chapter 10.

Before turning to the next section, it should not be forgotten that, in addition to the requirement for an identified legal basis, paragraph 7.5.4 stipulates that APMs, introduced in conformity with paragraph 7.5.3, should be "specifically tailored to meet the need of the area to prevent, reduce, or eliminate the identified vulnerability of the area from international shipping activities." This does not, however, amount to a legal requirement, but obliges IMO's competent organs to ensure appropriate application of a protective measure to prevent unnecessary constraints on navigational rights.

II. Options for Protective Measures

The PSSA Guidelines not only provide for abstract legal bases for measures possibly applied in designated areas; they also list examples of APMs, including navigational aids, discharge restrictions, CDEM standards and others.[264] The most relevant should be introduced with the aim of demonstrating the broad range of instruments that can be used to protect PSSAs and to examine conditions for their utilisation as APMs. Given the necessity to identify a legal basis for each APM in paragraph 7.5.3 of the PSSA Guidelines introduced above, I shall not only introduce how the protective measures could be applied, but also elucidate the criteria and limits set by the instruments on which they are based. If a particular protective

[264] Cf. para. 6.1 of the PSSA Guidelines.

measure is not provided for in a treaty or IMO instruments, I shall investigate whether it could be proposed for adoption in the territorial sea or pursuant to Article 211(6) of UNCLOS.

1. Navigational Aids

Prevention of accidents obviously bears advantageous effects for the marine environment. General rules for the sound navigation of vessels emerged long ago. In the 1960s, they were incorporated into the Convention on the International Regulations for Preventing Collisions at Sea (COLREG)[265], including provisions concerning properly maintained look-outs (Rule 5), safe speed depending on prevailing circumstances and conditions (Rule 6), and priority rules according to the vessels' ability to manoeuvre (Rule 18). All vessels are obliged to abide by these rules to prevent accidents, both in areas under and beyond national jurisdiction. However, in certain circumstances or areas, including most PSSAs, these general rules are perceived to be insufficient to protect the area appropriately from dangers posed by international shipping. A range of instruments has thus been developed which allow for the adoption of additional measures to facilitate safe navigation; they include certain provisions of COLREG itself, SOLAS and various IMO instruments, most of which have been adopted in the form of resolutions.

a) Routeing Measures

The term *routeing measure* encompasses a variety of instruments designed to organise and direct vessel traffic in order to contribute to safe navigation, including traffic separation schemes (TSSs) and areas to be avoided (ATBAs). The SOLAS Convention in Regulation V/10(1) of the Annex[266] maintains: "Ships' routeing systems contribute to safety of life at sea, safety and efficiency of navigation and/or protection of the marine environment. Ships' routeing systems are recommended for use by, and may be made mandatory […] when adopted and implemented in accordance with the guidelines and criteria developed by the Organization."[267] An accompanying footnote expressly refers to the "General provisions on ships' routeing adopted by the Organization by Resolution A.572(14), as amended".[268] The GPSR introduce procedural and material require-

[265] Adopted on 20 October 1972, in force as from 15 July 1977; current text, as amended, reproduced in IMO, *COLREG – Consolidated Edition 2003* (London: IMO Publication 2003).

[266] In the following sections, if not indicated otherwise, reference is always made to regulations of the annex of the SOLAS Convention. References are shortened for ease of reading.

[267] This particular regulation was amended in 1995 to reflect the contribution of routeing measures to marine environment protection; cf. Res. MSC.46(65), *Adoption of Amendments to the International Convention for the Safety of Life at Sea*, adopted 16 May 1995.

[268] The current text is reproduced in IMO, *supra*, note 218, Part A. Hereafter GPSR.

ments for a broad range of routeing systems. Originally, these measures could only be adopted on the basis of safety considerations. Amendments to the instrument, adopted in 1992 and 1995, took account of the obvious fact that safety of navigation and marine environment protection are inextricably linked and that environmental concerns may even constitute a stand-alone justification for routeing measures.[269] Hence, the objective of the GPSR now provides that routeing systems "may also be used for the purpose of preventing or reducing the risk of pollution or other damage to the marine environment caused by ships colliding or grounding in or near environmentally sensitive areas."[270] Measures may specifically be introduced to address "the organisation of safe traffic flow in or around or at a safe distance from environmentally sensitive areas".[271] Routeing measures are arguably the most important and effective means of protecting vulnerable marine areas.[272]

General requirements for routeing systems contemplated for adoption are set out in paragraph 5 of the GPSR. Paragraph 5.4 expressly provides that "a routeing system should not be established in areas where the instability of the sea-bed is such that frequent changes in the alignment and positions of the main channels, and thus of the routeing system itself, are likely." In addition, routeing systems "selected for a particular area should aim at providing safe passage for ships through the area without unduly restricting legitimate rights and practices, and taking account of anticipated or existing navigational hazards."[273]

The GPSR provide for traffic separation schemes, separation zones or lines, inshore traffic zones, precautionary areas, deep-water routes, and areas to be avoided. Traffic separation schemes (TSSs), the routeing measure used most frequently, are adopted by IMO pursuant to Rule 1(d) and Rule 10 of COLREG. Depending on the geographical features of the area where a TSS is to be implemented, it is either separated by separation zones or separation lines, while the former should be given priority.[274] A TSS may be complemented by the establishment of so-called inshore traffic zones to keep local traffic clear of the TSS.[275] Rule 10 of COLREG requires vessels using a TSS to proceed in the appropriate traffic lane and – so far as practicable – keep clear of a separation

[269] For details see, *infra*, Sec. I.3. of Chapter 11. The 1995 amendments are reproduced in Res. A.827(19), *Ships' Routeing*, adopted on 23 November 1995, Annex 3.
[270] Para. 1.1 of the GPSR.
[271] *Ibid*., para. 1.2.6.
[272] Gerard Peet, *supra*, note 114, pp. 556-576, at 563 argues that PSSAs existed "avant la lettre" (i.e. before formal introduction of the PSSA Guidelines) simply because certain areas were protected by IMO-approved routeing measures. Julian Roberts, "Protecting Sensitive Marine Environments: The Role and Application of Ships' Routeing Measures" 20 *IJMCL* (2005), pp. 135-159, at 146, remarks that New Zealand rather chose to protect a sensitive area in its territorial sea by the introduction of a mandatory Area to be Avoided than by the designation of a PSSA.
[273] Para. 5.1 of the GPSR.
[274] *Ibid.*, para. 4.1 and 4.2. The latter envisages the use of islands, shoals or rocks as a natural division for opposing traffic streams.
[275] *Ibid.*, para. 4.3.

zone or a separation line.[276] It furthermore contains provisions on the crossing or leaving of traffic lanes and recommended action in the case of an emergency.[277] In some congested areas, TSSs will inevitably meet. The GPSR therefore provide for roundabouts, junctions and crossings, the most appropriate method of which should be used to guide traffic.[278] They may also be used in conjunction with inshore-traffic zones or other routeing measures, as appropriate. Precautionary areas, defined in paragraph 2.1.12 as "a routeing measure comprising an area within defined limits where ships must navigate with particular caution and within which the direction of traffic flow may be recommended," are often established at the terminations of TSSs, or at roundabouts and junctions, to emphasise the need for extra care in these areas.[279] The benefits of precautionary areas for purely environmental reasons are doubtful, because their adoption does not entail any "measure" that mariners have to abide by.[280]

Deep-water routes may be adopted to provide mariners with recommended routes which have been "accurately surveyed for clearance of sea bottom and submerged obstacles."[281] This may be useful for steering vessel traffic away from shallower coastal waters or from areas where wrecks are likely to present a danger to safe navigation.

ATBAs are defined in paragraph 2.1.13 of the GPSR as a "routeing measure comprising an area within defined limits in which either navigation is particularly hazardous or it is exceptionally important to avoid casualties and which should be avoided by all ships, or certain classes of ships." Without any further definition, paragraph 4.6.2 merely refers to two exemplary figures. With respect to the planning of an ATBA, paragraph 5.5 orders the necessity for its creation to be well demonstrated and the reasons stated. Amongst others, unacceptable damage resulting from an accident may justify these safeguards. From what the wording of paragraph 2.1.13 provides for, one may be tempted to argue that a ban on all ships or a category of ships in a large PSSA could be based on the possibility of establishing ATBAs. In fact, a similar APM was contemplated for application in the Western European PSSA. Proposing governments suggested approving an APM prohibiting the passage of single-hull oil tankers of more than 600 deadweight tonnes carrying heavy grades of oil through the PSSA.[282] It is doubtful

[276] Para. (b) of Rule 10.
[277] Para. (c) to (e) of Rule 10.
[278] Para. 4.4.1 and .2 of the GPSR. Figure 10 (Precautionary area with recommended direction of traffic flow around an area to be avoided complemented by an inshore traffic zone) is an illustrative example of the combination of different routeing measures in a single routeing system. Further rules for converging and junction areas are contained in para. 6.19 and 6.20.
[279] This consideration is reflected in *ibid.*, para. 8.5 and 8.7.
[280] However, as has been alluded to, *supra*, in Sec. III.3. of Chapter 7, a precautionary area for purely environmental purposes will be established in due course in waters under the jurisdiction of New Zealand.
[281] Para. 2.1.11 of the GPSR.
[282] MEPC 49/8/1, *supra*, note 142, para 10. The proposal for that particular APM was eventually withdrawn. Cf. MEPC 49/22, *supra*, note 145, para. 8.23.3.

whether approving this proposal would have been lawful. Even though the definition's wording does not contradict such an approach, the practice of IMO to date suggests that the establishment of ATBAs is only envisaged for small areas to protect a specific environmentally sensitive site or to preclude obstructions to navigation caused by certain features of an area. IMO's approach is supported by the underlying rationale of the instruments providing for ships' routeing.[283] The establishment of an ATBA that covers the whole PSSA would contradict the purpose of routeing measures, which *a priori* aim at the organisation of vessel traffic rather than its prohibition.[284] ATBAs therefore constitute a last resort to be used as a complementary means[285] and any conduct to the contrary would arguably amount to an undue restriction of the freedom of navigation as reflected in UNCLOS. As all adopted ships' routeing systems, according to Regulation V/8(j) of SOLAS, must be consistent with international law, it is unlawful to completely declare large PSSAs as ATBAs.

Similar measures, incorporated in the GPSR through the 2000 Amendments[286], are so-called "no-anchoring areas". According to paragraph 2.1.14, they are defined as measures "comprising an area within defined limits where anchoring is hazardous or could result in unacceptable damage to the marine environment." While anchoring in these zones is to be avoided, it is permitted in the case of dangers to the ship or the persons on board. The respective GPSR amendments were catalysed by the US application for the Florida Keys PSSA, which contemplated the establishment of three no-anchoring areas, although there was no IMO instrument providing for these particular routeing measures.[287] To date, six no-anchoring areas have been designated, which are mandatory without exception and are all located in US waters.[288] Three areas are designed to protect the Flower Garden Banks coral reefs; the other no-anchoring areas are APMs to protect reefs within the Florida Keys PSSA.[289]

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[283] For an account of the routeing measures' purpose and principles, see Glen Plant, "The Collision Avoidance Regulations as a Regulator of International Navigation Rights: Underlying Principles and their Adequacy for the Twenty-first Century", 49 *Journal of Navigation* (1996), pp. 377-393, at 382 et seqq.

[284] Cf., in particular, para. 1.2.4 to .6 of the GPSR. These objectives are certainly to be taken into account, because the chapeau of para. 4 (Methods) stipulates that "*[i]n meeting the objectives set out in section 1*, the following are among the methods which may be used" (emphasis added). It should be noted, however, that this is only true of PSSAs as large as the Western European PSSA. An example to the contrary is the Galapagos Islands PSSA, see, *infra*, Sec. V.2. of this Chapter.

[285] Cf. *ibid.*, para 5.5.

[286] MSC 73/21/Add. 3, *Report of the Maritime Safety Committee on its Seventy-Third Session*, 14 December 2000, Annex 20.

[287] For measures protecting the Florida Keys PSSA, see, *infra*, Sec. V.2. of this Chapter. The impact of the Florida Keys PSSA proposal on the development of the GPSR is detailed, *infra*, in Sec. I.3. of Chapter 11.

[288] Note that a mandatory ATBA to be applied in the Italian territorial sea off Venice has recently been approved by NAV 52 and is pending approval by MSC; see, *infra*, note 298.

[289] See compilation in IMO, *supra*, note 218, Part G, p. II/2 et seq.

Further measures contemplated by the GPSR include recommended directions of traffic flow, two-way routes, recommended routes and tracks through areas where navigation is difficult or dangerous.[290]

According to the general jurisdictional rules set out by UNCLOS in Article 21 et seqq., coastal states are free to enact sea lanes or TSSs in their territorial sea unilaterally. Foreign vessels need to abide by them as long as they do not amount to an undue restriction of innocent passage. Nevertheless, it is reasonable to suggest that Article 22(3) lit. (a) of UNCLOS in conjunction with Article 24(1) requires all measures to conform to the GPSR in order to be compatible with UNLCOS.[291] With respect to the EEZ, in contrast, UNCLOS does not envisage any competence for coastal states to establish routeing measures third-state vessels need to conform to. When augmenting existing rules, IMO provided in 1997 for the adoption of mandatory routeing measures after a long and controversial discussion through the adoption of Resolution MSC.46(65), which amended SOLAS Regulation V/8, as well as the GPSR.[292] According to the latter's paragraph 2.1.2, a mandatory routeing system is "adopted by the Organization, in accordance with the requirements of Regulation V/8 of [SOLAS (now V/10)], for mandatory use by all ships, certain categories of ships or ships carrying certain cargoes." However, the shortcomings are evident. Although SOLAS Regulation V/10 is not confined to application in areas under national jurisdiction, it may not be applied in straits used for international navigation and archipelagic sea lanes.[293] Furthermore, the enforcement jurisdiction of coastal states does not correspond to broadened prescriptive jurisdiction, as rules regarding enforcement jurisdiction in Article 220 of UNCLOS are left unaltered. The 1997 SOLAS amendments have been the subject of some controversy, but they are arguably consistent with

[290] See para. 4.6 of the GPSR for details and explanatory figures.

[291] Henning Schult, *Das völkerrechtliche Schiffsicherheitsregime* (Berlin: Duncker & Humblot 2005), p. 184. Moreover, he rightly contends that Art. 22 of UNCLOS particularises the rights of Art. 21(1) rather than confines coastal states' jurisdiction to the enactment of sea lanes and TSSs. The coastal state is hence entitled to implement any routeing measure contained in the GPSR.

[292] Res. MSC.46(65), *Amendments to the International Convention for the Safety of Life at Sea, 1974*, adopted 16 May 1995. Respective changes to the GPSR were adopted by Res. A.827(19), *supra*, note 269, Annex 3. Cf. Glen Plant, "The Relationship between International Navigation Rights and Environmental Protection: A Legal Analysis of Mandatory Ship Traffic Systems", in H. Ringbom (ed.), *Competing Norms in the Law of Marine Environmental Protection* (Den Haag Boston London: Kluwer Law International 1997), pp. 11-29, at 21 et seqq. The view held by Marcus Schroeder, "Die technischen Regeln zur Erhöhung der Sicherheit von Öltankern", in Ch. Tomuschat (ed.), *supra*, note 75, pp. 49-77, at 61, that through the adoption of Res. A.572(14) in 1971 IMO already put itself in the position of introducing mandatory routeing systems cannot be concurred with.

[293] Regulation V/10(10).

international law, at least since they necessitate a decision made by the international community within IMO.[294]

Expanded possibilities have not yet led to a proliferation of mandatory routeing systems; probably due to the fact that, pursuant to paragraph 6.17 of the GPSR, "[t]he extent of a mandatory routeing system should be limited to what is essential in the interest of safety of navigation and the protection of the marine environment." To date, five mandatory routeing systems have been adopted. The first, a deep-water route adjacent to the German and Dutch Wadden Sea (Off the Frisian Islands in the North Sea), was approved in 1997.[295] After designation of the area as a PSSA in 2002, it became one of its APMs; it requires vessels with more than 10,000 GRT to make use of the routeing system. Furthermore, IMO approved no-anchoring areas for the Flower Gardens (Northwestern Gulf of Mexico/USA)[296], around the Florida Keys (USA),[297] as well as in the approaches to the Gulf of Venice.[298] A mandatory ATBA was approved in 2003 to protect the marine area around the Poor Knights Islands (New Zealand).[299] In contrast, a recent proposal for a mandatory TSS in the Norwegian Barents Sea was rejected by NAV 52[300], as were two proposed ATBAs in the Baltic Sea at the previous session.[301]

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[294] Likewise Henning Schult, *supra*, note 291, *loc.cit.*; Glen Plant, *supra*, note 292, p. 26 et seqq.; Julian Roberts, *supra*, note 272, p. 150; and Erik Jaap Molenaar, *supra*, note 229, p. 527.

[295] Cf. MSC 67/22, *Report of the Maritime Safety Committee on its Sixty-Seventh Session*, 16 December 1996, Annex 10. See also SN/Circ.184, *Mandatory routeing measures – "Mandatory route for tankers from North Hinder to the German Bight"*, 3 June 1997 and Corrigendum of 12 September 1997.

[296] See US proposal in NAV 46/3/3, *No anchoring areas for Flower Garden Banks in the Northwestern Gulf of Mexico*, 5 April 2000; approved by MSC, cf. MSC 73/21/Add.3, *supra*, note 286, Annex 21.

[297] The no-anchoring areas are APMs of the Florida Keys PSSA, see, *infra*, Sec. V.2. of this chapter.

[298] An Italian proposal contained in NAV 52/3/8, *Area to be Avoided/Mandatory No Anchoring Area in the Approaches to Gulf of Venice*, 12 April 2006. The measures were approved by NAV 52 and MSC 81 was invited to adopt them, cf. NAV 52/18, *supra*, note 223, Annex 2, p. 1; however, MSC 81 did not discuss the decision of NAV. Note that environmental considerations have only played a minor role. The no-anchoring area was primarily established to ensure safe operation of an offshore LNG terminal.

[299] Cf. NAV 49/3, *Proposed Area to be Avoided*, 16 January 2003; and MSC 78/26/Add.2, *Report of the Maritime Safety Committee on its Seventy-Eighth Session*, 4 June 2004, annex 22. New Zealand deliberately chose not to apply for the area to be designated as a PSSA, cf. Julian Roberts, *supra*, note 272, p. 146 et seqq. Proposals to establish two mandatory ATBAs in the Baltic Sea were recently rejected by NAV, see, *infra*, Sec. V.3. of this chapter.

[300] The Norwegian proposal is to be found in NAV 52/3/6, *New Mandatory Traffic Separation Scheme off the Coast of Norway from Vardø to Røst*, 12 April 2006. Additional information on the ecological characteristics of the area was submitted by WWF, cf. NAV 52/Inf.9, *Routeing of Ships, Ship Reporting and Related Matters*, 6 June 2006. The proposal was rejected, because a TSS of 560 nm(!) was seen as too heavy a burden for international shipping. Instead, Norway eventually proposed 8 voluntary TSSs and

Finally, procedural requirements for routeing measures should be mentioned, because they also apply to APM applications. They are split into two sections: paragraph 3.2 of the GPSR provides for rules dealing with the adoption of TSSs pursuant to COLREG Rule 10; paragraph 3.3-3.7 sets forth rules for routeing systems other than a TSS pursuant to SOLAS Regulation V/10. The former are formulated straightforwardly. IMO must merely assess whether aids to navigation enable mariners to conform to the TSS and whether the TSS complies with established methods of routeing. The latter assessment procedure is more sophisticated. In addition to requirements for TSS approval, IMO must ensure that the vital interests of the interested coastal states are not adversely affected. If measures are introduced to protect expressly the marine environment, it needs to be ensured that proposed measures have a significant protective effect and that the overall size and aggregate number of areas protected by routeing systems do not result in "unreasonably limiting the sea area available for navigation."[302] If a mandatory measure is examined, IMO must determine whether the justification for the mandatory character of the proposal is justified and whether ports or harbours of littoral states are not adversely affected.[303] To assist states in preparing proposals, IMO has issued a Guidance Note that sets forth, in an exemplary manner, information to be disseminated in an application.[304]

All routeing measures adopted by IMO are subject to review after a certain length of time. According to paragraph 5.2 of the GPSR, in reviewing a routeing system, several factors have to be taken into account by a government, including environmental issues (para. .8), the adequacy of existing aids to navigation, hydrographic surveys and nautical charts of the area (para. .7), existing traffic patterns in the area concerned, including coastal traffic, crossing traffic, naval exercise areas and anchorage areas (para. .3), as well as the existence of environmental conservation areas and foreseeable developments in the establishment of such areas (para. .9).

As has become apparent, ships' routeing systems include a broad array of instruments that states may implement in their waters. IMO consent needs to be obtained for some routeing measures in the territorial sea and for all measures to be applied in the EEZ. It appears that so far no routeing measures have been established on the high seas. IMO-approved measures are usually recommendatory, but may acquire binding force if applied for by coastal states and endorsed by IMO. With respect to these mandatory measures, IMO, by virtue of SOLAS and COLREG respectively, is given competence to adopt binding legal acts. Inasmuch as states have consented to respective treaty rules, they are bound by

seven recommended routes connecting them. The sub-committee approved the proposal as modified; cf. NAV 52/18, *supra*, note 223, para. 3.3.6 et seqq., and Annex 1, p. 1 et seqq. (a chart depicting the new TSS is reproduced on p. 6).

[301] See, *infra*, Sec. V.3. of this chapter.

[302] Para. 3.6.2 of the GPSR.

[303] *Ibid.*, para. 3.5.

[304] See MSC.Circ/1060, *Guidance Note on the Preparation of Proposals on Ships Routeing Systems and Ship Reporting Systems for Submission to the Sub-Committee on Safety of Navigation*, 6 January 2003.

decisions taken within IMO, even though these decisions are issued in the form of resolutions, to which the IMO constitution does not attach binding force. Of course, routeing measures, both mandatory and non-mandatory, can also be adopted outside PSSAs. The PSSA regime offers a possibility to house them under a single management roof; whether it also offers expanded enforcement rights compared with Article 220 of UNCLOS will be examined below in Chapter 10.

b) Ship Reporting Systems

Ship reporting systems (SRSs) provide means that "contribute to safety of life at sea, safety and efficiency of navigation and/or protection of the marine environment."[305] They aim to give notice to coastal states of vessels present in a specific marine area, where these ships may represent a threat to, *inter alia*, the marine environment. Vessels subject to a particular SRS are at least required to transmit their name, call sign, IMO identification number and position[306], while communication should generally "be limited to information essential to achieve the objectives of the system."[307] Further information, for example on the category of hazardous cargo, may only be requested if the system could otherwise not be managed effectively.[308] As Regulation V/11(1) of SOLAS clarifies, an SRS may be adopted for "all ships or certain categories of ships or ships carrying certain cargoes."

By virtue of Regulation V/11(2), IMO is the competent organisation to adopt SRSs, as well as to issue the regulations that these systems need to conform to. Over the course of the years, IMO has developed both SRS General Principles [309] and more specific SRS Guidelines and Criteria.[310] The latter elaborate on procedures and considerations governments are to follow in proposing mandatory SRSs for adoption by IMO. In particular, they clarify that SRSs should be considered for adoption only if supported by a demonstrated need to address concerns, such as the safety of life at sea, the safety and efficiency of navigation or the protection of the marine environment.[311] The SRS General Principles set

[305] Regulation V/11(1) of SOLAS.
[306] Para 2.2.1.3 of the *Guidelines and Criteria of Ship Reporting Systems*, cf. Res. MSC.43(64), as amended by Res. MSC.111(73) and Res. MSC.189(79); hereafter SRS Guidelines and Criteria.
[307] Para. 1.1.1 of Res. A.851(20), *General Principles for Ship Reporting Systems and Ship Reporting Requirements, Including Guidelines for Reporting Incidents Involving Dangerous Goods, Harmful Substances and/or Marine Pollutants*, adopted on 27 November 1997. Hereafter SRS General Principles.
[308] Para. 2.2.1.4. of the SRS Guidelines and Criteria.
[309] Res. A.851(20), *supra*, note 307.
[310] See, *supra*, note 306.
[311] MSC/Circ.1060, *Guidance Note on the Preparation of Proposals on Ships' Routeing Systems and Ship Reporting Systems for Submissions to the Sub-Committee on Safety of Navigation*, Annex, para. 3.4 et seqq.

out, in very broad terms, requirements that SRSs need to comply with, as well as standard reporting formats and procedures.[312]

Even though the term "mandatory" is avoided in the text, *adopted* SRSs are, in fact, mandatory systems, as they "*shall* be used by all ships."[313] The wording deployed by paragraph (1) and (2) of the respective SOLAS regulation does not appear to exclude any SRS from the requirement to obtain IMO approval.[314] However, along the lines of reasoning applied, *supra*, with respect to routeing measures, it is sensible to contend that coastal states under Articles 21 et seqq. of UNCLOS do not have to submit to IMO SRSs envisaged for application in the territorial sea in order to gain approval.[315] Nevertheless, even these systems need to conform to rules laid down in the SRS General Principles and the SRS Guidelines and Criteria not to exceed the limits set by Articles 22(3) and 24(1) of UNCLOS.[316] Within IMO, member states have expressed different views on that question. For instance, plans by Spain to introduce unilaterally a mandatory SRS in its territorial sea were opposed by several IMO member states on the grounds that it was established before submission to IMO.[317] Some states, on the other hand, believe that such conduct is lawful.[318] In practice, all systems that should become mandatory are considered within IMO and most voluntary schemes are at least announced. Obviously, submission to IMO is the most convenient way for coastal states to make new regulations known to all interested parties.

Governments wishing to apply for the adoption of an SRS must be able to demonstrate the need for the proposed system and provide information pertaining to, amongst others, existing vessel traffic, hydrographical and meteorological factors, as well as its geographical coverage, which may be decisive for decision-making. In addition, they need to abide by the procedural requirements set forth by the SPS Guidelines and Criteria. Several PSSAs, including the Great Barrier

[312] The standard reporting format is contained in the appendix to the SRS General Principles, para. 2.

[313] Regulation V/11(7) of SOLAS (italic emphasis added). The origin of that phrase is elucidated by Henning Schult, *supra*, note 291, p. 190. For the wider implications of mandatory SRSs, see Christopher P. Mooradian, "Protecting 'Sovereign Rights': The Case for Coastal State Jurisdiction over Vessel-Source Pollution in the Exclusive Economic Zone", 82 *B. U. L. Rev.* (2002), 767-816, at 808 et seqq.

[314] See Glen Plant, *supra,* note 292, p. 17. In note 38, referring to SOLAS Regulation V/11(4), he states that "this clumsily worded paragraph is merely to maintain the present legal position vis-à-vis systems that the operating state wishes to remain voluntary and does not bother to submit to IMO." This view is supported by Henrik Ringbom, *Environmental Protection and Shipping – Prescriptive Coastal Jurisdiction in the 1990's*, Marius No. 124 (Oslo: Nordisk Institutt for Sjørett 1996), p. 61.

[315] Similar Erik Jaap Molenaar, *supra*, note 229, p. 213.

[316] Henning Schult, *supra*, note 291, p. 191, in note 568.

[317] MSC 71/23, *Report of the Maritime Safety Committee on its Seventy-First Session*, 2 June 1999, para. 20.30; submission by Spain is contained in MSC 71/20/12, *New watch alarm systems and optimization of ship-to-shore communications*, 18 February 1999.

[318] Cf. statement by the Canadian delegation, MSC 63/23, *Report of the Maritime Safety Committee on its Sixty-Third Session*, 12 June 1994, para. 3.24.

Reef PSSA, the Canary Islands PSSA and the Western European PSSA, are protected by mandatory reporting systems as APMs. The last serves as a valuable example of how an SRS is implemented in practice. In 2004, proponents of the Western European PSSA suggested the adoption of a mandatory SRS (West European Tanker Reporting System [WETREP]) for parts of the area, which was eventually approved by MSC.[319] It was introduced to inform coastal state authorities of the presence of vessels carrying potentially hazardous oil cargoes. Accordingly, participation in WETREP is mandatory for oil tankers of more than 600 tonnes deadweight, carrying heavy crude oil, heavy fuel oils or bitumen and tar or their emulsions. Upon entry into the reporting area or immediately on departing within it, the respective vessels must report basic information, including the ship's call sign, its course, speed and destination. Additionally, vessels are obliged to transfer information to enable coastal-state authorities to carry out adequate search and rescue operations, such as the number of persons on board.

An SRS established for environmental purposes usually aims to protect the marine environment of respective areas in a rather broad manner. The only systems so far established solely to protect a single marine species from shipping impact have been approved as mandatory SRSs "off the northeastern and southeast coast of the United States" in the US EEZ.[320] Approval of these particular SRSs was unprecedented, because "[o]ther systems, in contrast, have been established for areas with known navigational hazards; they are aimed at preventing groundings, collisions, and spills from navigational hazards."[321] The SRS "off the northeastern and southeast coast of the United States" was designed to protect the North Atlantic Right Whale, which is at serious risk from ship strikes.[322] Consequently, the purpose of this particular SRS is to prevent ship strikes by notifying mariners upon entry into the area of whales that have been sighted in the area covered by the SRS.

Traditionally, communication with SRS authorities is carried out by means of radio. A technically more advanced alternative is the use of shipborne automatic identification systems (AIS). They are designed automatically to exchange information with shore stations and other equally equipped ships regarding the ship's identity, type, position, course, speed, navigational status and other safety-related information. In appreciating the constant progress in engineering, IMO decided in 2002 to facilitate the use of AIS by adopting respective guidelines

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[319] Res. MSC.190(79), *Adoption of Mandatory Ship Reporting System in the Western European Particularly Sensitive Sea Area*, adopted on 6 December 2004.

[320] Res. MSC.85(70), *Mandatory Ship Reporting Systems*, adopted on 3 December 1998. Cf. Patricia Birnie, "Implementation of IMO Regulations and Oceans Policy Post-UNCLOS und Post-UNCED", in M.H. Nordquist and J.N. Moore (eds.), *supra*, note 104, pp. 361-390, at 376 et seq.

[321] Rachel Canty, "The Coast Guard and Environmental Protection – Recent Changes and Potential Impacts", 52 *Naval War College Review* (1999) No. 4, pp. 77-89, at 77.

[322] Ship strikes are the largest source of human-related mortality. For more details, see, *supra*, Sec. III.3 of Chapter 2.

supplementing SOLAS Regulations V/11, 12 and 19.[323] The last contains general requirements for the operation of AIS in paragraph 2.4. It stipulates that "[a]ll ships of 300 gross tonnage and upwards engaged on international voyages and cargo ships of 500 gross tonnage and upwards not engaged on international voyages and [all] passenger ships […] shall be fitted with an [AIS]." The various time limits set in that provision have now elapsed for all ships engaged in international shipping; other ships must be fitted with equivalent systems by 1 July 2008 at the latest. It is hoped that AIS will enhance the safety and efficiency of navigation and thereby contribute to the protection of the marine environment, even though its impact is limited, as some vessels are not subject to the equipment requirements. Although information submitted under SRSs pursuant to Regulation V/11 of SOLAS and information automatically provided by an AIS overlap to a great extent, it is unlikely that SRSs will become redundant in the near future. Under SRS regulations, coastal-state authorities may request information pertaining to the cargo and its potential hazardous nature, whereas paragraph 2.4.5.1 of Regulation V/19 does not expressly mention transmitting this kind of sensitive information.[324]

c) Vessel Traffic Services

In contrast to SRSs, vessel traffic services (VTS) involve two-way communication to enable coastal-state authorities to facilitate vessel traffic by giving information, advice, or, if need be, instructions. By managing and planning vessel traffic, they contribute to safe and efficient navigation and to the protection of the marine environment. SOLAS Regulation V/12 provides for the legal basis for adopting VTS systems.[325] To flesh out these general rules, IMO has developed respective guidance documents.[326] The VTS Guidelines make a clear distinction between port VTSs, concerned with vessel traffic to and from a harbour, and coastal VTSs, concerned with vessels on voyage through the territorial sea.[327] Both types of VTS systems may include, according to the VTS Guidelines, information services (at fixed times or at the request of the vessel), navigational assistance services and traffic-organisation services. Whereas ships only transmit information to SRS shore stations once, usually upon entry into the covered area, communication with

[323] Res. A.917(22), *Guidelines for the Onboard Operational Use of shipborne automatic identification systems (AIS)*, adopted on 29 November 2001.

[324] Information on the cargo particulars cannot be subsumed under the term "other safety-related information", as is rightly argued by Henning Schult, *supra*, note 291, p. 198.

[325] Res. MSC.65(68), *Adoption of Amendments to the SOLAS Convention*, adopted on 4 June 1997, as Regulation V/8-2, before being renumbered V/12. The legal issues involved prior to respective SOLAS amendments are spelt out by Glen Plant, "International Legal Aspects of Vessel Traffic Services", 14 *Marine Policy* (1990), pp. 71-81, at 73 at seqq.

[326] IMO has adopted VTS Guidelines, see Res. A.857(20), *Guidelines for Vessel Traffic Services*, adopted on 27 November 1997, Annex 1 (hereafter VTS Guidelines), as well as Guidelines on Recruitment, Qualifications and Training of VTS operators, reproduced in Annex 2 of the same resolution.

[327] Res. A.857(20), *supra*, note 326, Annex 1, para. 2.1.2.

a VTS station is done "on a regular and periodic, as well as individual, basis and is more likely to involve a comprehensive system of surveillance."[328] However, SRSs and VTSs may often be linked, since information provided by a vessel under a SRS may represent helpful data for a VTS.[329] The distinction has thus been said to become blurred[330], an observation that may pose some difficulties.

Contrary to SOLAS Regulations V/10 and V/11, alluded to above, Regulation V/12 foresees neither mandatory application beyond the territorial sea[331] nor involvement of IMO in the establishment of VTS systems. Hence, unless established in an UNCLOS special area according to Article 211(6), the adoption of mandatory systems in the EEZ, but also in straits used for international navigation and in archipelagos, let alone the high seas, would contradict SOLAS. In referring to measures available from Article 211(6), PSSAs may thus provide a good opportunity for promoting the implementation of VTSs in maritime zones other than territorial sea, because SOLAS does not expand coastal states' powers compared with their competences acquired by Article 21 et seqq. of UNCLOS.

With respect to missing references to IMO, it can be noted that SOLAS contracting parties must follow the VTS Guidelines[332], as IMO's contribution towards the efficient application of these systems is recognised. It is reasonable to contend that coastal states, when establishing VTS systems in their territorial sea, do not contradict innocent-passage rights as long as they stick to the guidelines. However, it has been maintained that it is unlawful to deploy traffic-organisation services – the most restrictive type of service – in VTS systems other than port VTSs.[333] Port VTSs may have additional features because their establishment is not only based on Part IV of UNCLOS but also on Article 211(3), that gives coastal states some leeway in determining conditions for entry into their ports.[334] This view is seemingly supported by paragraph 2.1.2 of the VTS Guidelines, which states that "in a port VTS a navigational assistance service and/or traffic organization service is provided for, while in a Coastal VTS usually (*sic*!) only an information service is rendered." However, with a view to exceptional circumstances in PSSAs, it can be contended that in some areas covered by coastal VTS systems, characteristics are, in fact, unusual so that the introduction of traffic-organisation services may be warranted. One should be careful to utter absolute conclusions but rather consider the lawfulness of VTS systems on a case-by-case basis. Undue restrictions of innocent-passage rights can be avoided if the

[328] Glen Plant, *supra*, note 292, p. 20. According to the IMO's VTS Guidelines, "the efficiency of a system will depend on the reliability and continuity of communications." See Res. A.857(20), *supra*, note 326, Annex 1, para. 2.1.3.
[329] This is expressly envisaged in para. 1.1 of the SRS General Principles.
[330] Glen Plant, *supra*, note 292, p. 20. In addition, it should be noted that SOLAS Regulation V/11(6) requires any SRS to "have the capability of interaction".
[331] Para. 3.
[332] SOLAS Regulation V/12(3).
[333] Henning Schult, *supra*, note 291, p. 200.
[334] See, *supra*, Sec. III.2.f) of Chapter 6.

requirements of paragraph 2.3.4 of the VTS Guidelines are taken seriously.[335] PSSAs may therefore be protected by port, as well as coastal, VTS systems that provide the full range of services.

d) Pilotage

Pilotage is one of the oldest means of facilitating vessel traffic. Generally, pilots with local knowledge may be employed by the shipmaster to guide a vessel in or out of harbours or through areas where navigation is possibly hazardous. Today, pilots are usually employed by coastal or port authorities and offer their services to shipmasters. Where pilotage schemes are introduced by coastal states, they can be either recommendatory or compulsory in character. It has proven to be a valuable way of reducing accidents in environmentally sensitive areas. For instance, after the introduction of mandatory pilotage in the inner route of the Great Barrier Reef PSSA in October 1991, the number of accidents was reduced by more than 50%, dropping from 1.667 to 0.727 a year.[336] However, no provision in SOLAS or any other international treaty expressly addresses pilotage.[337] Nevertheless, as early as 1968, IMO issued recommendations on pilotage by adopting Resolution A.159(ES.IV), highlighting circumstances in which the deployment of pilots is particularly useful. It should be noted that pilotage is not a CDEM standard, as the pilot is only temporarily on board the ship, is not a member of the crew and may merely give advice to the ship's master. Pilots resemble a VTS system, with the only notable difference that they communicate with the master in person and not just by means of radio.[338]

States usually seek to have IMO recommend the use of pilots for a particular area. Yet, as recommended pilotage schemes are not always followed by vessels[339] – due to various reasons, time and financial constraints being only two of them –, states may seek to establish mandatory pilotage schemes for certain areas under their control. Because there is no specific legal basis for pilotage in existing treaty law, mandatory schemes need to abide by general rules laid down in UNCLOS.

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[335] It requires that instructions should be result-oriented only to ensure that encroachment upon the master's responsibility for safe navigation is kept to a minimum.

[336] NAV 50/3, *supra*, note 150, para. 5.2. Another example is IMO's recommendation to use pilotage in the Great Belt for vessels with a draught of 11m and more. 22 ships went aground between January 2002 and June 2005 – none of them had employed a pilot; cf. Danish Maritime Authority, *Safety Study – Groundings and Collisions 1997-2005 in the Great Belt* (2005), available from <http://soefart.inforce.dk/graphics/Synkron-Library/Sofartsstyrelsen/Publikationer/OKE/Temaundersoegelser/Temaundersoegelsgroundingsandcollisions 011005.pdf>; (accessed on 30 September 2006), p. 14 et seq.

[337] SOLAS Regulation V/23 merely requires vessels likely to employ pilots to be provided with sufficient transfer arrangements. This provision is accompanied by several IMO resolutions on technical details, such as Res. A.889(21), *Pilot Transfer Arrangements*, adopted on 25 November 1999.

[338] Henning Schult, *supra*, note 291, p. 218.

[339] For instance, figures for compliance with recommended pilotage in the Torres Strait, approved by IMO Res. A.710(17), dropped from a rate of 70% in 1995 to about 35% in 2002; cf. NAV 50/3, *supra*, note 150, para. 5.6.

Accordingly, pilotage schemes in the territorial sea, the EEZ and in straits used for international navigation need to conform to Article 21 et seqq., Article 56 et seqq. and Article 38 et seqq. respectively. Hence, the establishment of mandatory pilotage schemes as APMs would be possible in both the territorial sea and the EEZ, as it is prohibited neither by Articles 21 and 24 of UNCLOS nor by Article 211(6).[340] Of course, the palpable difference is that for establishing a compulsory pilotage scheme in its EEZ, a coastal state is required to obtain approval by IMO.

A different situation arises with respect to international straits, since the transit passage regime leaves little leeway to strait states for implementing protective measures unilaterally. It is arguably reasonable to contend that mandatory pilotage, if endorsed by IMO, represents "generally accepted international regulations, procedures and practices" that vessels, according to Article 39(2) of UNCLOS, have to comply with when exercising transit passage. Nonetheless, the legal context is more complex, as a recent example shows. Establishing mandatory pilotage in straits designated as a PSSA has been a matter of controversy within IMO.[341] Australia and Papua New Guinea submitted an application to extend the existing Great Barrier Reef mandatory pilotage APM to cover the Torres Strait, that was awarded PSSA status in 2004.[342] As it was impossible for these states to introduce such a scheme unilaterally, they sought IMO approval as an APM. While several maritime states held the view that such a measure would contradict international law in the absence of any international treaty addressing the issue, the two proponents contended that it would be consistent with, in particular, Part III of UNCLOS.[343] They argued that mandatory pilotage approved by IMO would constitute a generally accepted international procedure as envisaged by Article 39(2) and may thus be implemented by respective strait states.[344] It would furthermore be a necessary complement to TSSs in the area, in order to foster compliance with these routeing measures. In the event, IMO member states

[340] Art. 211(6) lit. (c), allowing for the designation of special areas in the EEZ (and providing a legal basis for APMs), permits for the prescription of "navigational practices", under which pilotage can be subsumed. IMO's secretariat has also mentioned compulsory pilotage as a possible APM in MEPC 46/6/1, *Additional Protection for Particularly Sensitive Sea Areas (PSSAs)*, 19 January 2001, para. 2.4.10.

[341] See MEPC 53/24, *supra*, note 28, para. 8.1 et seqq.

[342] The proposal submitted by Australia and Papua New Guinea is to be found in MEPC 49/8, *Extension of Existing Great Barrier Reef PSSA to include the Torres Strait Region*, 10 April 2003, in particular in para. 5.7 et seqq.; the GBR pilotage scheme applies to all vessels longer than 70m and all loaded oil tankers, chemical tankers or gas carriers, irrespective of size. The system would have replaced recommended pilotage, adopted by Res. A.710(17), *Use of Pilotage Services in the Torres Strait and the Great North East Channel*, adopted on 6 November 1991.

[343] The different viewpoints are reflected in NAV 50/19, *Report to the Maritime Safety Committee*, 28 July 2004, para. 3.14 et seqq., and LEG 89/16, *Report of the Legal Committee on the Work of its Eighty-Ninth Session*, 4 November 2004, para. 222 et seqq.

[344] Cf., in particular, LEG 89/15, *Torres Strait PSSA Associated Protective Measure – Compulsory Pilotage*, 24 August 2004, which contains an extensive legal analysis of the issue; and NAV 50/3, *supra*, note 150, para. 5.10 et seq.

merely agreed to "strongly recommend" the use of the pilotage scheme.[345] It will be seen in the future whether declining compliance rates will go up again thanks to express IMO endorsement. More generally, given the explicit opposition of many states to subject international straits to mandatory pilotage schemes, even if these straits are designated as PSSAs, it will be unlikely to see IMO moving beyond recommending the use of pilots. In my view, the use of pilots is not intended to hamper transit passage but to facilitate safe and efficient voyage. Opposition to extended strait states' jurisdiction over vessels hence seems to be informed by arguments to do with principle. However, arguments brought forward to support compulsory pilotage in the Torres Strait PSSA are not compelling. First, given the contentious nature of compulsory pilotage, such a scheme cannot be considered to be included in "*generally accepted* international regulations, procedures and practices" (italic emphasis added) as mentioned in Article 39(2) of UNCLOS. Secondly, compulsory pilotage cannot be considered to be a necessary complement to TSSs that strait states are allowed to establish in waters under their jurisdiction: Article 42(1) lit. (b) limits strait states' competence to adopting laws and regulations in respect of "the prevention, reduction and control of pollution, by giving effect to applicable international regulations regarding the discharge of oil, oily wastes and other noxious substances in the strait." Recent developments indicate that the dispute over pilotage in the Torres Strait PSSA will continue, as Australia by means of domestic legislation now imposes severe penalties for non-compliance with the pilotage scheme.[346] In the event, the dispute is likely to be dealt with by one of the dispute-settlement mechanisms provided for by UNCLOS Part XV.

2. Discharge Restrictions

A second category of protective measures are discharge restrictions. The PSSA Guidelines themselves, in paragraph 6.1.1, mention MARPOL special area or SECA standards to be approved as APMs. These standards may be made applicable by way of Article 211(6) lit. (c) of UNCLOS.[347] They exceed normal MARPOL requirements as far as the discharge of oil, noxious liquid substances and garbage, as well as SO_x is concerned.[348] The apparent advantage of this approach is that marine areas, in order to qualify as PSSAs, only need to meet one criterion, while the designation of MARPOL special areas requires an area to meet

[345] Res. MEPC.133(53), *Designation of the Torres Straits as an Extension of the Great Barrier Reef PSSA,* adopted on 22 July 2005, para. 3. Pilotage is also recommended by Res. MSC.138(76) for the Baltic Sea Area PSSA, which recommends that local pilotage services should be used by every ship with a draught of 11 metres or more, loaded oil tankers with a draught of 7 metres or more in the Sound, loaded chemical tankers and gas carriers, irrespective of size, and ships carrying INF cargoes, irrespective of size.

[346] Some shipping industry NGOs have informed IMO of the Australian Government's conduct, see MEPC 55/8/3, *Torres Strait*, 10 August 2006.

[347] Cf., *supra*, in Sec. III.3 of Chapter 4.

[348] MARPOL special areas and SECAs are dealt with, *supra*, in Sec. I.1. of Chapter 5.

a set of criteria cumulatively.[349] Furthermore, while MARPOL special areas are designated by an amendment to the respective annexes (a process that can take years), PSSAs are designated by an MEPC resolution, which approves a standard that is established by domestic legislation.

An indirect way of achieving similar results, at least for PSSAs located near the coast, is to redefine the term "nearest land," as deployed by MARPOL Annexes I, II, IV and V to mean the outward boundary of the designated area instead of "the baseline from which the territorial sea of the territory in question is established."[350] This definition of "nearest land" serves as a basis for measuring the distances relevant for all MARPOL discharge restrictions. Thus, aligning the boundaries of the PSSA with the coordinates of the "nearest land" would prohibit discharges both inside the PSSA and in the waters adjacent to it. So far this has only been done for the GBR PSSA;[351] interestingly, the definition was also changed in Annex IV, that does not envisage the establishment of special areas, to protect the GBR from pollution by harmful substances carried by sea in packaged form.[352] Modifying the definition of "nearest land" for a PSSA is not an APM in the strict sense. It cannot be adopted by inclusion in the resolution establishing the PSSA; it rather needs to be incorporated by amending the text of the respective MARPOL annex.[353] But as its protective implications may be wider than applying stricter discharge standards, it may be worth considering for governments going down that route.

It should finally be noted that discharge restrictions may be contemplated not only for substances that are inherently dangerous, but also for ships' ballast water. Ballast water is usually taken on board a ship to ensure that she is perfectly balanced and stable even when unloaded. The problem that arises with respect to ballast water is that it is taken on board in one place and discharged back into the sea in another place, possibly thousands of miles away from its place of intake.[354] Organisms living in the ballast water could prove to be harmful for the marine ecosystem they are discharged into. The international community has recognised the scale of the problem and, under the auspices of IMO, states adopted the Ballast

[349] For MARPOL special area requirements, see, *supra*, Sec I.1.a) of Chapter 5; for PSSA criteria, see, *supra*, Sec. II.1. of Chapter 7; for a comparison of the regimes, see, *infra*, Sec. I.1.b) of Chapter 9.

[350] Regulation 1(9) of Annex I.

[351] MEPC 46/6/1, *supra*, note 340, para. 2.4.6. It was also suggested as a further protective measure for the Sabana-Camagüey Archipelago PSSA by Kristina M. Gjerde, "IMO approves Protective Measures for Cuba's Particularly Sensitive Sea Area in the Sabana-Camagüey Archipelago", 14 *IJMCL* (1999), pp. 415-422, at 420.

[352] Regulation I/1(9); II/1(4); IV/1(5); V/1(2).

[353] This is a comparatively complicated and time-consuming procedure. However, a proposal to make the definition of "nearest land" automatically applicable to all PSSAs has not been followed up, cf. Kristina M. Gjerde, *supra*, note 351, in note 21.

[354] An instructive overview is given by the Global Ballast Water Management Programme, "The Problem", available from <http://globallast.imo.org/index.asp?page=problem.htm &menu=true>; (accessed on 30 September 2006).

Water Convention[355], that has yet to enter into force, in 2004. The Convention consists of the main text and an annex, which includes technical standards and requirements. Parties are obliged to give full effect to the convention's regulations in order to prevent, minimise and ultimately eliminate the transfer of harmful aquatic organisms and pathogens.[356] Vessels must comply with the convention's regulations from 2009.[357] Minimum requirements stipulate that taking or discharging ballast water must usually be done at least 50 nm from the nearest land and at a depth of 50 metres. However, parties are given the right to take, "individually or jointly with other parties, […] more stringent measures necessary to prevent, reduce or eliminate the transfer of harmful aquatic organisms and pathogens," consistent with international law.[358] Interpreting the respective provision of the annex, *Tsimplis* has observed that "the correct view is that Regulation C describes the method by which these additional measures should be imposed and the ways they will be communicated rather than conditions which if not satisfied will result in deprivation of the right prescribed in Article 2(3)."[359] Stricter standards are thus arguably consistent with international law if adopted as more stringent requirements for entry into ports pursuant to Article 211(3) of UNCLOS.[360] They also appear to conform to UNCLOS' regimes for the territorial sea and the EEZ – at least when endorsed by the IMO through the approval of an APM[361], since the procedure for approving APMs would also conform to the requirement that a prior consultation should include all "states that may be affected."[362] APMs could thus address and prohibit ballast water exchange in a specific area. Where this is done, the coastal state is to notify mariners, indicate alternative routes and facilitate vessels' compliance by providing appropriate arrangements.[363] It appears that the PSSA Guidelines provide a basis for justifying measures that are based on an instrument which exists but has yet to enter into force. In this regard, it should be noted that a ballast water prohibition area would not force ships to comply with all BWC standards before its entry into force. Such

[355] International Convention for the Control and Management of Ships' Ballast Water and Sediments, adopted on 13 February 2004, reproduced in Michael Tsimplis, "Alien Species Stay Home: The International Convention for the Control and Management of Ships Ballast Water and Sediments 2004", 19 *IJMCL* (2004), pp. 411-482, at 446 et seqq. Hereafter BWC.

[356] Art. 2(1) of the BWC.

[357] It depends on the type of ship and the year of construction. A detailed table of the implementation dates is compiled by Michael Tsimplis, *supra*, note 355, p. 434.

[358] Art. 2(3) and annex, Regulation C-1(1) of the BWC.

[359] Michael Tsimplis, *supra*, note 355, p. 439. The wording of Regulation C-1 strictly allows only for the prohibition of ballast water uptake and discharge in areas representing a specific risk. The apparent approach of the BWC is primarily to enable the cleanup of polluted areas, rather than the protection of biodiversity in clean areas.

[360] Cf. contention of the United States uttered in BWM/Conf./12, *Consideration of the Draft International Convention for the Control and Management of Ships' Ballast Water and Sediment – Outstanding Issues*, 5 January 2004, p. 1.

[361] Michael Tsimplis, *supra*, note 355, p. 438 et seq.

[362] Annex, Regulation C-1(2) of the BWC.

[363] *Ibid*., Regulation C-3 and C-1(3)(4).

a measure would thus not constitute an undue burden but rather a reasonable precautionary measure to protect areas vulnerable to alien organisms.

3. Standards concerning Construction, Design, Equipment and Manning of Ships

Generally, the leeway for IMO to approve APMs requiring compliance with certain construction, design, equipment and manning (CDEM) standards is quite narrow. This is due to the fact that their implementation is eventually based on coastal states' jurisdictional rights in the territorial sea or in UNCLOS special areas of the EEZ, if they are not provided for in multilateral treaties. Nevertheless, it is worth considering the array of CDEM standards possibly available for application in a PSSA.

Several CDEM requirements that spring to mind concern equipment that would enhance the ship's ability to navigate safely, including AIS and ENC/ECDIS systems. As has been mentioned above, while AIS has already been introduced as a general binding requirement for most categories of ships, similar requirements for ENC/ECDIS are highly disputed.[364] Consent to an APM requiring their use is therefore very unlikely. In addition, the usefulness of area-specific requirements to equip vessels with any of these systems is limited. There is therefore no justification for such CDEM standards to be introduced under the terms of Article 211(6) of UNCLOS. Article 21does not constitute an appropriate legal basis either, as it is restricted to the implementation of generally accepted international rules and standards.

Another CDEM standard is a ban on certain types of ships that are constructed in a manner possibly hazardous to the marine environment. A prominent example is the proposed ban on single-hull tankers carrying certain forms of crude oil in the Western European PSSA. As said above, this APM would have constituted either an ATBA for certain classes of ships or a CDEM standard requiring double hulls for certain classes of ships. Compared with an ATBA, the legal requirements for CDEM standards contained in UNCLOS are much stricter. To avoid confusion, ATBAs that are rather CDEM standards in disguise should be approved according to the rules applying for the latter. Otherwise, the APM would undermine the system of balanced right as reflected in UNCLOS, which subjects coastal states' CDEM standards to the tight limits of generally accepted international rules and standards to avoid the emergence of different standards a ship has to comply with during her voyage. Prohibiting the transit of a whole category of ships – whose use is still in line with respective MARPOL provisions[365] – clearly violates existing law of the sea rules. Banning certain types of ships from a PSSA is therefore impossible, at least if the PSSA covers an area as large as the Western European PSSA. That said, it should be noted that this finding is without prejudice to the establishment of ATBAs, which are necessary both from an environmental

[364] See, *supra*, Sec. III.1. of Chapter 7.

[365] According to Regulation 13G of Annex I, the phase-out scheme for single-hull tankers has only just started.

and a shipping safety point of view and clearly conform to respective provisions of the GPSR.

Emergency towing arrangements are fitted on board ships to ease the deployment of tugs in case of distress.[366] SOLAS Regulation II-1/3-4 prescribes emergency towing arrangements for all tankers of not less than 20,000 tonnes deadweight. They must be fitted at both ends on board these ships. Whether this requirement should be extended to other categories of ships is currently the subject of discussion within MSC and the DE sub-committee.[367] Since an all-encompassing regulation is still lacking, emergency towing equipment requirements may be contemplated as an APM for vessels in a PSSA.[368] It would be a measure available under Article 211(6) of UNCLOS. When drawing up proposals for respective APMs, proposing states need to take account of problems identified by the DE working group.[369] However, in the light of the fact that IMO tends to focus on functional requirements for procedures rather than requiring additional equipment for ships other than those addressed by the existing SOLAS regulation[370], it seems unlikely that an APM of the said manner is going to be approved.

A possible APM for ice-covered areas (always or at certain times) are ice-resistant hulls, as was contemplated for the Baltic Sea Area PSSA[371], based on HELCOM Recommendation 25/7[372] addressing special requirements set for maritime traffic at low temperatures and in icy conditions in the winter. IMO has already adopted related IMO guidelines for ships in arctic waters that are

[366] Whilst during bad weather conditions the deployment of tugs without emergency towing equipment can last more than one hour, emergency towing equipment ensures that this operation is accomplished in fewer than five minutes.

[367] MSC 81/25, *Report of the Maritime Safety Committee on its Eighty-First Session*, 24 May 2006, para. 7.14. Discussions were triggered by a German proposal, as a result of recommendations developed by the Grobecker Commission in the aftermath of the *Pallas* accident off the German Coast, contained in MSC 76/20/3, *Mandatory emergency towing systems (ETS) in ships other than tankers greater than 20,000 tdw, 20 June 2002; and DE 47/24/1, Mandatory emergency towing systems (ETS) in ships other than tankers greater than 20,000 dwt*, 26 November 2003. A Formal Safety Assessment of the proposal is contained in MSC 77/23/7, *Mandatory emergency towing systems (ETS) in ships other than tankers greater than 20,000 dwt – supplementary information*, 28 January 2003.

[368] This APM was suggested for application in the Wadden Sea PSSA by WWF-Projekt-team Pallas, *Schutz des Wattenmeeres vor Schiffsunfällen durch Einrichtung eines „PSSA Wattenmeer"* (Frankfurt am Main: WWF Deutschland 2000), p. 28 et seq.

[369] DE 49/WP.5, *Report of the Drafting Group*, 22 February 2006, para. 5.

[370] Discussions within DE on this topic are summarised in DE 48/25, *Report to the Maritime Safety Committee*, 5 March 2005, para. 14; and DE 49/20, *Report to the Maritime Safety Committee*, 8 March 2006, para. 7.6 et seqq.

[371] See Peter Ehlers, "Schiffssicherheit nach der Prestige", 14 *ZUR* (2003), pp. 342-349, at 345.

[372] HELCOM Rec. 25/7, *Safety of Winter Navigation in the Baltic Sea Area*, adopted on 2 March 2004.

contained in MSC/Circ.1056[373] that could arguably be used as a blueprint for drafting an APM. Article 234 of UNCLOS gives coastal states considerable leeway for the enactment of laws relating to, *inter alia*, CDEM standards.[374] It does not, however, provide a legal basis for respective APMs adopted by IMO. Hence, they could only be based on Article 211(6) lit. (a) of UNCLOS. Whether APMs lawfully respect freedom of navigation must be ascertained by recourse to Article 234. Because this provision determines the threshold for acceptable interference with navigational rights in ice-covered areas, freedom of navigation is weakened to a "due regard to navigation" requirement. This may be understood as limiting the right to deviate from usual competences to reasonable measures in the light of the prevailing conditions.[375] Hence, the approval of special ice-resistant construction requirements is lawful, because they clearly increase the safety of ships to a considerable degree. Navigational rights, as modified in the said manner, cannot be construed as being impaired.

4. Other Measures

Navigational aids, discharge restrictions and CDEM standards represent the bulk of measures applicable as APMs. In the following section, other measures should be looked at with a view to their possible application as an APM.[376]

One of those other measures to be contemplated is tug escort. Recommendatory tug escort schemes have been introduced by many countries and were contemplated as an APM, for instance, in the Baltic Sea Area PSSA.[377] Tug escort

[373] MSC/Circ.1056 (also MEPC/Circ.399), *Guidelines for Ships Operating in Arctic Ice-Covered Waters*, 23 December 2002, especially para. 2.1 and 2.2, setting forth construction provisions.

[374] See, *supra*, Sec. III.3. of Chapter 4.

[375] D.M. McRae and D.J. Groundey, "Environmental Jurisdiction in Arctic Waters: The Extent of Article 234", 16 *U.B.C. L. Rev.* (1982), pp. 197-228, at 221 et seqq.

[376] A broad array of instruments has been compiled by both the International Seminar on the Protection of Sensitive Sea Areas, held in Malmö, Sweden in 1990 (results are reproduced in Peter Ottesen, Stephen Sparkes, and Colin Trinder, *supra*, note 119, pp. 507-522, at 519 et seq.) and the First Meeting of Legal Experts on PSSAs in Hull, England in 1992, the report of which is reproduced in Kristina Gjerde and David Freestone, *supra*, note 125, pp. 431-468, appendix 1, in particular para. 7 et seq. Only few of these instruments, however, relate to the regulation of shipping in a strict sense. See also GAUSS, *Ausweisung eines PSSA in dem Seegebiet vor den Niederlanden, Deutschland und Dänemark, Gutachterliche Studie* (February 2000), available from <http://194.94.25.228/rootcollection/gaussdoc/gutachten/pssa>; (accessed on 30 September 2006), p. 29 et seq.

[377] MEPC 51/8/1, *Designation of the Baltic Sea Area as a Particularly Sensitive Sea Area*, 19 December 2003, p. 18, para. 5.13: "One of the measures that could be taken into account after a risk assessment is the use of escort tugs. A large ship with one engine and one rudder is exposed to the risk of machinery failure which could lead to a grounding with accompanying consequences. Connected in the stern with a special keel an escort tug can counter a blocked rudder on a large ship and steer it. Escort tugs could also be used in very narrow waters. Escort and escorting tugs are introduced in many

requirements do not constitute CDEM standards.[378] Nevertheless, it appears that tug escort has been made mandatory in very few places, e.g. in several states in the U.S. One example is the Californian Lempert-Keene-Seastrand Oil Spill Prevention and Response Act of 1990[379], that requires tug escorts for vessels carrying oil products calling at a Californian port. Similar provisions can be found in Best Achievable Protection Regulations of the State of Washington[380], which obliges vessels to be escorted by tankers in and out of ports if they do not comply with the law's safety requirements. Both examples concern tug escort in ports, for which states are free to set whatever entry requirements as a condition.

Further measures can address ships carrying ultra-hazardous nuclear material (INF Code materials). Compared with other cargoes, the shipment of INF code materials represents a much bigger threat, because rescue and salvage operations are extremely difficult. IMO and the International Atomic Energy Agency (IAEA) have developed instruments dealing with the shipment of nuclear cargoes: the INF Code and the IAEA Code on Transboundary Movement of Radioactive Waste respectively.[381] While blanket exclusion in PSSAs of ships carrying INF code material is arguably inconsistent with international law[382], requirements for prior notification established by an APM are probably lawful, at least in the territorial sea, where they can be based on Article 21 of UNCLOS.[383] It makes it possible for the coastal state to prepare adequate response measures. However, notification requirements are part of SRSs that have already been addressed, *supra*, in Section II.1.b) of this chapter.

Consideration may also be given to the introduction of environmental fees, such as user charges, for transiting the PSSA. In operationalising the polluter pays

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countries around the world to avoid groundings." It was also suggested as a proposal for an APM for the Wadden Sea PSSA by WWF-Projektteam Pallas, *supra*, note 368, p. 24 et seqq.

[378] The U.S. Supreme Court, in examining the pre-emptive effect of federal laws on the Washington Tanker Law of 1975, in *Ray v. Atlantic Richfield Co.*, 6 March 1978, 435 *U.S.* 151 (1978), at p. 171, rightly held: "[a] tug-escort provision is not a design requirement, such as is promulgated under Title II. It is more akin to an operating rule arising from the peculiarities of local waters that call for special precautionary measures, and, as such, is a safety measure clearly within [the authority] to establish 'vessel size and speed limitations and vessel operating conditions' and to restrict vessel operation to those with 'particular operating characteristics and capabilities'".

[379] California Codes, Government Code, Sec. 8670.1 et seqq.; in particular Sec. 8670.17.2.

[380] See Wash. Rev. Code (RCW), 88.16.190; and Wash. Admin. Code (WAC), 363-116-500.

[381] See Jon M. Van Dyke, "The Legal Regime Governing Sea Transport of Ultrahazardous Radioactive Materials", 33 *ODIL* (2002), pp. 77-92; and Raul A.F. Pedrozo, "Transport of Nuclear Cargoes by Sea", 28 *J. Mar. L. & Com*. (1997), pp. 207-236.

[382] Raul A.F. Pedrozo, *supra*, note 381, p. 231, citing NAV 42/WP.7/Add.2 of 18 July 1996 and MEPC 38/WP.9 of 9 July 1996 reflecting discussions within IMO.

[383] Examples are given by Glen Plant, "Legal Environmental Restraints upon Navigation post-Braer", 10 *OGLTR* (1992) 245-268. For a detailed analysis see Jon M. Van Dyke, *supra*, note 381, p. 87 et seq. He holds that ships not complying with a prior consultation or notification scheme render their voyage non-innocent.

principle, user charges aim at ensuring that external (environmental) costs are internalised, i.e. reflected in the price of the product or service, in order to set economic incentives to minimise environmental impacts. For instance, the point of reference for calculating the charge could be based on the amount of a vessel's greenhouse-gas emissions or its construction date; vessels transiting a particular marine area are consequently more likely to be low-emission ships or of young age (and thus relatively safe) respectively. A study initiated by the German Federal Environmental Agency (*Umweltbundesamt* – UBA) has recently examined the admissibility of charges for the use of air and sea.[384] Findings of the study with regard to the oceans were generally positive; nonetheless, they were subject to a number of caveats derived from the UNCLOS framework. In the territorial sea, user charges for the mere passage of vessels are prohibited by Article 26(1). According to paragraph 2 of Article 26, charges may be levied for specific services, such as pilotage, but that does not constitute an adequate legal basis for environmental fees.[385] With respect to the EEZ and the high seas, a complementary conclusion can be drawn, inasmuch as in the absence of a provision similar to Article 26 no charges may be levied at all, even under the special circumstances set out by Article 211(6). The authors of the study contended that the only suitable point of reference for environmental fees is a ship's calling at a port, because states exercise unrestrained jurisdiction over their ports and their internal waters.[386] I concur with the contention that port fees are lawful under the UNCLOS regime. However, port fees are a matter solely for the port states (or the individual port authorities) to decide. They do not need approval by IMO and would not feature as an APM.

Even if one assumes that a legal basis could be established for introducing environmental fees in the territorial sea or the EEZ, it is doubtful, in my view, how a particularly protective effect for the marine environment could be established – given that the PSSA Guidelines stipulate that APMs may only be approved if they "provide the needed protection from the threats of damage posed by international maritime activities occurring in and around the area."[387] Although the underlying economic rationale rightly assumes that the area subjected to a user-charge regime would be avoided by ships that pose a comparably high environmental risk, a fee scheme would make shipping as such neither easier to facilitate nor safer. Still, the fee scheme could conform to the guidelines' requirements if it is adjusted to the specific vulnerabilities of the PSSA in question by choosing an adequate point of reference, such as the emission of nitrogen dioxide or the type of anti-fouling paint used on the ship's hull. In addition, the money received through charges could probably be made available to support shipping management or conservation measures in the PSSA and thus foster compliance with respective APMs and

[384] ECOLOGIC, *Legal Aspects of User Charges on Global Environmental Goods*, UFOPLAN 2004, FKZ 204 14 105, (Berlin: Ecologic 2006). See also WBGU, *Entgelte für die Nutzung globaler Gemeinschaftsgüter* (Berlin: WBGU 2002).

[385] ECOLOGIC, *supra*, note 384, p. 171.

[386] Cf. Sec. III.2.f) of Chapter 4. Alternative options, including the adoption of a multilateral treaty on user charges, have been explored by WBGU, *supra*, note 384, p. 26 et seqq.

[387] Para. 7.5.2.1 of the PSSA Guidelines.

further secure the PSSA's integrity, especially in waters under the jurisdiction of developing countries.

However, another significant hurdle must be overcome. Even though it has been pointed out elsewhere that user charges would have very little impact on exports from developing countries[388], I would argue that it is highly unlikely that an APM allowing for a fee scheme would gain sufficient support within IMO. As recent debates on the reduction of vessels' greenhouse-gas emissions have shown, developing countries would not approve of any scheme potentially tantamount to a competitive disadvantage for their ships.[389] To sum up, it can be noted that a user charge for PSSAs faces too many legal and political restrictions to be feasible for adoption as an APM, despite the theoretical suitability of PSSAs to be protected by this type of measure. IMO member states must seek to address the issue of user charges by the adoption or amendment of a treaty instrument that does away with the confines set by UNCLOS.

A further measure contemplated as an APM is a "reduced noise" requirement.[390] Because it constitutes a CDEM standard, its introduction would be unlawful, as there are no generally accepted international rules and standards regulating the reduction of vessel noise for environmental purposes. Thus, coastal states could not act unilaterally unless IMO has adopted an instrument to which they could give effect. However, reduced noise can also be achieved by requiring vessels to reduce their speed. Reduced-speed requirements are routeing measures envisaged by the GPSR and thus within the purview of IMO to approve as an APM.[391] This measure can thus even be enacted as a binding requirement.

Finally, what should be examined as a protective measure are restrictions on cargo transfer. In some circumstances it may be necessary to prohibit the transfer of cargo from vessel to vessel to prevent hazardous substances from entering the marine environment by accident. In 2005, the matter came before MEPC 53[392], after Spain and Mexico had proposed adding a new chapter and a new appendix to MARPOL Annex I to address risks posed by ship-to-ship transfer of oil cargoes.[393] Denmark concurred with the view expressed by Spain and Mexico[394], highlighting

[388] WBGU, *supra*, note 384, p. 31.

[389] Based on the author's experience as a member of the German delegation to MEPC 51. With respect to the specific case of greenhouse gas emissions, the developing countries repeatedly invoked the principle of common but differentiated responsibilities contained in the UN Framework Convention on Climate Change.

[390] See GAUSS, *supra*, note 376, *loc.cit*.

[391] For instance, the TSS "between Korsoer and Sprogoe" (Denmark) was amended in 2003 to include a recommended speed reduction for ships to a maximum of 20 knots before they enter the appropriate lane of the scheme, see NAV 49/19, *Report to the Maritime Safety Committee*, 28 July 2003, para. 3.8.

[392] For a summary of the discussions, see MEPC 53/24, *supra*, note 28, para. 20.1 et seqq.

[393] MEPC 53/20, *Amendments to Annex I of MARPOL 73/78 intended to prevent the risk of pollution during oil transfer operations between ships at sea*, 23 November 2004.

[394] MEPC 53/20/2, *Comments on the proposed amendments to MARPOL Annex I intended to prevent the risk of pollution during oil transfer operations between ships at sea*, 27 May 2005.

the need to give coastal states additional competences to enable the establishment of authorisation or notification schemes.[395] In contrast, some shipping NGOs, while supporting in principle the proposal, raised doubts as to the applicability of such schemes and expressly referred to the ban of ship-to-ship operations in PSSAs.[396] In the event, MEPC agreed to forward the issue to the BLG sub-committee to be included as a priority item in their programme of work. The sub-committee is expected to present a proposal to MEPC in 2007.[397] Since efforts within IMO have not yet produced any result, there is no legal instrument available to IMO providing for such a measure. As the prohibition of cargo transfer is an operating rule rather than a CDEM standard, an APM can, however, be based on Article 21 of UNCLOS and may thus also be made applicable in the EEZ, assuming that it does not impact on navigation but on the operations of a ship that lies in a specific place, and, of course, in the internal waters of a coastal state, as was noted with respect to the GBR PSSA.[398]

III. Establishment of APMs in Buffer Zones and Outside PSSAs

The PSSA Guidelines in paragraph 6.3 state that "[i]n some circumstances, a proposed PSSA may include within its boundaries a buffer zone, in other words, an area contiguous to the site-specific feature (core area) for which specific protection from shipping is sought. However, the need for such a buffer zone should be justified in terms of how it would directly contribute to the adequate protection of the core area." Although thought was given to expanding the buffer-zone concept during the 2005 revision of the PSSA Guidelines[399], paragraph 6.3 is still the only provision on buffer zones and it may therefore be asked whether

[395] *Ibid.*, para. 6.

[396] MEPC 53/20/3, *Proposed amendments to Annex I of MARPOL 73/78 intended to regulate oil transfer operations between ships at sea*, 13 May 2005, annex, para. 3.3.

[397] MEPC 53/24, *supra*, note 28, para. 20.6. BLG has not yet concluded its work on this issue. It established a correspondence group to continue work on the proposal, see BLG 10/19, *Report to the Maritime Safety Committee and the Marine Environment Protection Committee*, 30 May 2006, para. 15.9 et seqq. Regarding "the possibility of establishing a total ban for STS oil transfer operations within Special Areas or PSSAs, the Sub-Committee decided that this was not a suitable proposition and that any intended prohibition could rather be dealt with on a case-by-case basis, for instance as an Associated Protective Measure in a PSSA. The Sub-Committee agreed to task the correspondence group with exploring if additional generic requirements were necessary for Special Areas and PSSAs." *Ibid*., para. 15.13.

[398] Peter Ottesen, Stephen Sparkes and Colin Trinder, *supra*, note 119, p. 521, at note 26, report that the Australian Government refused to issue a permit for a transfer of nickel ore between vessels at sea. The cargo was destined for a refinery located adjacent to the GBR PSSA.

[399] MEPC 52/8/2, *Proposed amendments to Resolution A.927 (22) on the Identification and Designation of Particularly Sensitive Sea Areas (PSSA)*, 6 August 2004, para. 7 et seqq. ICS and INTERTANKO, who submitted the document held, in particular, that buffer zones should be used to link several smaller core areas.

APMs are confined to the core area or whether they can also be made applicable in buffer zones, or even outside PSSAs. Given the silence of the PSSA Guidelines on this issue, it would be reasonable to contend that APMs can also be established in buffer zones. It would make no sense to include a buffer zone in the area covered by the designation, but at the same time refrain from applying APMs outside the core area. Establishing an APM in a buffer zone is moreover the only way in which it can be proven that it "directly contribute[s] to the adequate protection of the core area", as required for its inclusion. The argument for allowing approval of APMs outside the actual boundaries of a PSSA follows this line of reasoning. In some circumstances, areas adjacent to a PSSA may not meet the criteria for particular sensitivity. However, this does not render these areas insufficient for applying APMs. Quite on the contrary, in certain cases it is indeed necessary to adopt an APM for application outside the PSSA. An indication is given by paragraph 1.2.6 of the GPSR that reads: "The precise objectives of any routeing system […] may include […] the organization of safe traffic flow in or around or *at safe distance from* environmentally sensitive areas" (emphasis added). The PSSA Guidelines envisage the most efficient protection of sensitive marine areas against the threats of international shipping. It would therefore be contrary to their purpose to prohibit the approval of APMs that are applied outside the designated area but that are effective for the area for which protection is sought.

IV. Procedural Requirements and Assessment of APM Proposals

General requirements for governments with respect to PSSA applications have been dealt with in the previous chapter. In the following section, I shall thus confine the description to those procedural aspects expressly related to the application for, and the assessment of, APMs.

An application, first, needs to clarify "steps that the proposing Member Government has taken or will take to have the measure approved or adopted by IMO pursuant to an identified legal basis";[400] alternatively, it "should identify the threat of damage or damage being caused to the area by international shipping activities and show how the area is already being protected from such identified vulnerability by the [APMs]."[401] A brief summary of the APM should introduce its main features and demonstrate "how the identified vulnerability will be addressed by existing or proposed [APMs]".[402] It should furthermore include the reasons why a specific APM was given priority over other protective measures. Generally, a PSSA application consists of two parts, the second of which addresses APMs.

[400] Para. 7.1 of the PSSA Guidelines.

[401] *Ibid.*, para. 7.2. In this case, there is no assessment procedure to be followed. Para. 7.2 and 7.3 were a matter of contentious discussions during the 2005 revision, because, as was argued by the Russian Federation, in particular, they retain the concept of "designation in principle", which many states sought to abolish. Cf. MEPC 53/8/2, *supra*, note 157, para. 5 et seqq.

[402] Para. 7.4. of the PSSA Guidelines.

This part should include a description of the proposed APM and its contribution to protection from threats posed by international shipping;[403] identify its legal basis;[404] provide information with regard to its legal basis and/or the steps necessary for establishing a legal basis;[405] and specify the category/categories of vessels to which the proposed APM applies, including vessels entitled to sovereign immunity.[406] Moreover, the application should indicate possible impacts on the safety and efficiency of navigation, including consistency with the respective legal instrument, implications for vessel safety and vessel traffic.[407] According to paragraph 7.5.2.2 of the PSSA Guidelines, a draft of the proposed APM must be appended to the application.

After the PSSA application is submitted, the APM proposal(s) will be assessed separately. The assessment is performed by the (sub-)committee responsible for administering the legal instrument on which the APM is based. The respective application is forwarded by MEPC (see Chapter 7, Table 1). According to paragraph 8.3.3 of the PSSA Guidelines, the competent committee then "should review the proposal to determine whether it meets the procedures, criteria, and other requirements of the legal instrument under which the measure is proposed. The sub-committee may seek the advice of the MEPC on issues pertinent to the application."[408] Apart from the specific requirements of the legal instrument, the organ-in-charge of IMO also needs to make recourse to the general requirements for the PSSA assessment when examining the APM proposal, namely (1) the appropriateness of the APM in the light of other measures available; (2) the potential for significant adverse effects by international shipping activities on the environment outside the proposed PSSA; and (3) a causal link between the PSSA's attributes, the identified vulnerability and the APM's potential to prevent, reduce or eliminate the vulnerability.[409]

Formally, as has been seen above, IMO assesses each proposal for an APM on the basis of requirements formulated by the respective legal instrument. It is not said in the PSSA Guidelines whether special circumstances in PSSAs should be taken into account in this assessment process. *Schult* has argued that "the designation of an area provides strong evidence that a particular traffic regulation measure is necessary for ecological reasons."[410] IMO's practice shows that the establishment of an APM is usually not contentious and thus appears to support *Schult*'s argument. It is, however, obvious that a PSSA has to be protected *somehow*, and states are therefore willing to grant protection to PSSAs by

[403] *Ibid.*, para. 7.5.2.1.
[404] *Ibid.*, para. 7.5.2.3.
[405] *Ibid.*, para. 7.5.2.2.
[406] *Ibid.*, para. 7.5.2.5.
[407] *Ibid.*, para. 7.6.
[408] It is sensible to assume that the last phrase is not confined to sub-committees but that requests for advice may also be made by the MSC or the Assembly.
[409] Para. 8.2.1 to .3 of the PSSA Guidelines.
[410] "[…] ist [die Ausweisung] ein starkes Indiz dafür, dass eine bestimmte Verkehrsregelungsmaßnahme aus Umweltgründen geboten ist." Henning Schult, *supra*, note 291, p. 214. (own translation).

approving APMs. But practice within IMO shows that whenever a state – in particular, a state that perceives itself as an advocate of navigational rights – feels that an essential aspect of freedom of navigation is in danger of being impaired, it is likely to initiate notable opposition against the APM in question. The discussion then quickly goes beyond legal subtleties to address serious political questions regarding vessels' navigation rights. In this respect, the fact that an area has been designated as a PSSA does not seem progressively to push states to accept a measure.

Reflecting the fact that every marine environment is subject to changes over time, the PSSA Guidelines envisage the necessity that IMO provides a forum for the review and re-evaluation of any APM based on comments, reports and observations of the APM. Member governments of IMO are invited to bring forward any concern their ships encounter when complying with the respective APM and government(s) that had proposed the APM may "also bring any concerns and proposals for additional measures or modifications to any [APM] to IMO."[411] Given that proposing governments, when applying for a new APM or an amendment to an existing APM, should direct a proposal to the appropriate committee in order to obtain approval for the protective measures[412], a review of an APM will also be carried out by the (sub-)committee responsible for addressing the underlying instrument. The MEPC need not be involved, unless it itself is the competent committee with regard to a specific APM.

V. Similarities and Differences of Hitherto Designated Areas

The main features of the PSSA concept have now been illuminated. In order to give a concise impression of the instrument, I shall complement theoretical considerations with IMO's and coastal states' practice regarding the designation of PSSAs and approval of APMs. It will be interesting to note the characteristics of those areas which have been designated so far and to compile an account with respect to APMs – those that have been approved by IMO, as well as those that were rejected.

1. Marine Areas Designated as PSSAs

It was already mentioned that the first version of the PSSA Guidelines was adopted in 1991. Even before that, MEPC identified the first PSSA. Since then, ten further areas were designated. In the following section, these areas will be introduced in chronological order.

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[411] Para. 8.4.

[412] Para. 7.10. Note that NAV as a sub-committee often addresses the merits of an APM. Nevertheless, it is always the main committee that adopts a final decision.

The first PSSA to be designated was the *Great Barrier Reef* (GBR) off Queensland/Australia[413], which was later extended to include the *Torres Strait*, of which Australia and Papua New Guinea are littoral states.[414] Interestingly, the GBR PSSA was not only applied for before the 1991 PSSA Guidelines were formally adopted by the Assembly[415], but was also designated prior to the adoption of the Guidelines. As has been observed above, the GBR PSSA is today largely considered as the blueprint for the PSSA concept.[416] It is the largest coral reef in the world, providing a habitat for the world's greatest marine biological diversity, and has long been recognised as an area in need of conservation and protection.[417] The Torres Strait is located in the north of the GBR. It is about 90 nm wide and 150 nm long. However, as most parts of the strait are shallow waters, the navigable routes for international shipping do not exceed a few hundred metres in some places.[418] The Strait's environment is characterised by "extensive seagrass beds, resident dugong and turtle populations, coral reefs, sand cays, mangrove islands, inactive volcanic islands and granite continental islands."[419] All of the approximately 30,000 indigenous people inhabiting the islands and coastal areas of the PSSA extension depend on subsistence fishing and gathering.[420] The MEPC concluded that the Torres Strait meets several of the ecological criteria of the PSSA Guidelines, including "uniqueness or rarity" and "critical habitat."

Seven years after the first designation, a second PSSA was accepted.[421] Cuba's *Sabana-Camagüey Archipelago* comprises more than 2,515 beautiful islands and small keys, which nonetheless were opened for sustainable tourism.[422] A coral reef, about 400 kilometres long and stretching along the outer edge of the archipelago, is considered to be one of the most significant of the Wider Carib-

[413] Res. MEPC.44(30), *Identification of the Great Barrier Reef as a Particularly Sensitive Sea Area*, adopted on 16 November 1990.

[414] Res. MEPC.133(53), *Designation of the Torres Strait as an Extension to the Great Barrier Reef Particularly Sensitive Sea Area*, adopted on 22 July 2005. For a chart of the area, see *ibid.*, Annex 1, para. 1.3.1.

[415] The application can be found in MEPC 30/19/4 and MEPC 30/19/4/Add.1, *Identification of the Great Barrier Reef as a particularly sensitive sea area*, 19 September 1990.

[416] Peter Ottesen, Stephen Sparkes and Colin Trinder, *supra*, note 119, p. 519.

[417] Wendy Craik, "The Great Barrier Reef Marine Park: Its Establishment, Development and Current Status" 25 *MPB* (1992), pp. 122-132, at 122 et seq.; Australian Maritime Safety Authority, *Review of Ship Safety and Pollution Prevention Measures in the Great Barrier Reef* (July 2001), available from <http://www.amsa.gov.au/Shipping_Safety/Great_Barrier_Reef_Review/GBR_Review_Report/Documents/gbr.pdf>; (accessed on 30 September 2006), p. 4.

[418] MEPC 49/8, *supra*, note 342, annex, para. 4.1.2.

[419] *Ibid., p.* 2.

[420] *Ibid., p.* 10.

[421] Res. MEPC.74(40), *Identification of the Archipelago of Sabana-Camaguey as a Particularly Sensitive Sea Area*, adopted on 25 September 1997. For sea charts, see Kristina M. Gjerde, *supra*, note 351, p. 416.

[422] Kristina M. Gjerde and J. Sian H. Pullen, "Cuba's Sabana-Camagüey Archipelago: The Second Internationally Recognised PSSA", 13 *IJMCL* (1998), pp. 246-262, at 246.

bean Region in terms of its size and the diversity of its species.[423] It fulfils important functions with regard to the protection of the archipelago. Most parts of the archipelago are particularly under threat from the debris of maritime operations.[424]

One year after the 2001 guidelines were adopted, two further PSSAs were designated, *Malpelo Island* (Colombia)[425] and the area around the *Florida Keys* (USA).[426]

Malpelo Island, situated between the Cocos Islands and the Galapagos Islands in the Colombian Pacific, is framed by coral formations and offers a great biological richness with an abundance of species of high value to the fishing industry.[427] It is the crest of an undersea mountain, about 500 kilometres away from the mainland of Colombia.[428] Although Colombia was requested by MEPC 43, after its scrutiny of the initial application[429], to submit further information on the proposed area[430], MEPC 44 could not approve the designation either as certain parts of the application were still missing, including a chart of the area and information on vessel traffic and its possibly hazardous impacts.[431] It was not until the 46th session that MEPC was able to approve the PSSA application in principle, pending the approval of an ATBA.[432] Following MSC's endorsement of the establishment of the ATBA, Malpelo Island was designated a PSSA at MEPC 47.

The Florida Keys PSSA includes all the islands comprising the Florida Keys[433], which are a habitat for a huge variety of plants, fishes and corals. The boundaries of the PSSA are based on coral reefs that form the third largest barrier reef system in the world. It does not only serve as a critical habitat for numerous endangered and threatened species but also as an important breeding and spawning ground. To reflect ecological necessities, the designated area also includes seagrass meadows

[423] MEPC 38/19, *Designation of the Sabana-Camagüey Archipelago as a Particularly Sensitive Sea Area*, 31 January 1996, annex, para. III.

[424] Cf. MEPC 29/Inf. 27, *Pollution of Cuban Coasts by Dumping From Ships*, 18 January 1990. One of the main sources of marine debris are cruise ships; cf., *supra*, Sec. III.1. of Chapter 2.

[425] Res. MEPC.97(47), *Identification of the sea area around Malpelo Island as a Particularly Sensitive Sea Area*, adopted on 10 October 2002.

[426] Res. MEPC.98(47), *Identification of the sea area around the Florida Keys as a Particularly Sensitive Sea Area*, adopted on 10 October 2002.

[427] MEPC 44/7, *Designation of Malpelo Island as a Particularly Sensitive Sea Area*, 3 December 1999, annex; MEPC 46/6/3, *Additional Information for the designation of Malpelo Island as a PSSA*, 16 February 2001.

[428] MEPC 46/6/3, *supra*, note 427, annex, p. 5 and 6.

[429] MEPC 43/6/7, *Designation of Malpelo Island as a "particularly sensitive sea area"*, 30 April 1999.

[430] MEPC 43/21, *Report of the Marine Environment Protection Committee on its Forty-Third Session*, 6 July 1999, para. 6.33.

[431] Cf. MEPC 44/20, *supra*, note 132, para. 7.20 et seq.

[432] MEPC 46/23, *Report of the Marine Environment Protection Committee on its Forty-Sixth Session*, 16 May 2001, para. 6.9 et seqq.

[433] Chartlet of the area in MEPC 46/6/2, *Designation of the marine area around the Florida Keys as a PSSA*, 19 January 2001, Annex 2.

and mangroves on which the health of the coral reef system depends.[434] Most of the PSSA is in the territorial sea of the U.S., with some parts extending into the EEZ. When the application was submitted to MEPC 46, it was unanimously praised as an excellent example of a coherent and well-prepared document that should serve as a model for future applications by other member states.[435] MEPC was thus able to consider all relevant issues at that session and, accordingly, designated the area in principle.[436] At its next session, final designation was granted.

In autumn 2002, MEPC designated the *Wadden Sea* of the Netherlands, Germany and Denmark a PSSA[437], following a proposal submitted jointly by the three states.[438] The Wadden Sea is a unique "highly dynamic tidal ecosystem of global importance".[439] It is characterised by, in particular, tidal flats and salt marsh systems, and a broad array of tidal channels and barrier islands that separate the Wadden Sea from the North Sea.[440] Its features represent a unique transitional environment between land and sea, which has created numerous ecological niches. The designated area covers approximately 15,000km² within the territorial sea and the internal waters of the proposing states.[441] Since no new APMs were proposed for adoption, MEPC was able both to review the environmental implications of the proposal[442] and to confer final designation upon the area at its 48th session in 2002.[443]

At the next session, the *Paracas National Reserve* (Peru) was designated a PSSA.[444] The marine part of the national reserve complements an exceptional coastal subtropical desert and is "one of the most biologically productive marine

[434] MEPC 46/6/2, *supra*, note 433, p. 3 et seqq.
[435] MEPC 46/23, *supra*, note 432, para. 6.8.
[436] *Ibid.*, para. 6.7.
[437] Res. MEPC.101(48), *Identification of the Wadden Sea as a PSSA*, adopted on 11 October 2002.
[438] MEPC 48/7/2, *Designation of the Wadden Sea as a Particularly Sensitive Sea Area*, 28 June 2002. The Trilateral Governmental Conferences on the Protection of the Wadden Sea had already contemplated a PSSA application in 1994 and in 1997; see relevant paragraphs of final statements reproduced in WWF-Projektteam Pallas, *supra*, note 368, Annex 1.
[439] Wadden Sea Secretariat, "The Wadden Sea designated as Particularly Sensitive Sea Area (PSSA)", available from <http://www.waddensea-secretariat.org/tgc/pssa/pssa-designation.html>; (accessed on 30 September 2006).
[440] MEPC 48/7/2, *supra*, note 438, para. 2.4. See further Peter Schütte, *Der Schutz des Wattenmeers – Völkerrecht, Europarecht, nationales Umweltrecht* (Baden-Baden: Nomos Verlagsgesellschaft 2001), p. 23 et seqq.
[441] See nautical chart of the PSSA at <http://www.waddensea-secretariat.org/news/documents/pssa/PSSA-appl-annex2.pdf>; (accessed on 30 September 2006).
[442] Cf. MEPC 48/WP.14, *Outcome of the Informal Working Group*, 9 October 2002.
[443] See further Bettina Reineking, "The Wadden Sea Designated as a PSSA", 27 *Wadden Sea Newsletter* (2002), No. 2, pp. 10-12.
[444] Res. MEPC.106(49), *Identification of the Archipelago of the Paracas National Reserve as a Particularly Sensitive Sea Area*, adopted on 18 July 2003.

areas in the world".[445] The PSSA includes three islands and was internationally recognised, *inter alia*, as a Ramsar wetland site in 1992 as it is a habitat for an abundance of migratory bird species.[446] Furthermore, it has a large population of seals and other marine mammals. Its shallow waters – the Bay of Paracas ranges from 0 to 7 metres in depth – encourage the "photosynthetic processes or primary productivity of phytoplankton and algae which start the trophic chain."[447] After having designated the PSSA in principle at MEPC 48, MEPC 49, following the approval of an ATBA by NAV/MSC, approved final designation of the area.[448]

MEPC 52 designated as a PSSA an area that is called *Western European Waters* and comprises parts of the Atlantic EEZs of Spain, Portugal, France, Belgium, the UK and Ireland.[449] Designating this particular area was probably one of the most contentious decisions taken by IMO.[450] It prompted opposition due to its large size and some IMO member states felt that the proposed area did not represent a single ecosystem but a set of biological units and that most ecological criteria were not met for the entire area but only for certain parts of it. In fact, the different parts of the Western European PSSA have few common features, the most important of which is the rich presence of marine mammals and (sea) birds. In the northern part, in Irish and British waters, some of the richest fishing grounds in Europe can be found.[451] This specific area is also home to many seabirds and the endangered Bottlenose Dolphin.[452] Further south, off the Belgian and French coasts, the water is very shallow, characterised by many sandbanks and several huge estuaries, which have a particular significance for marine biodiversity and represent essential spawning and breeding grounds for fish.[453] The peculiarity of the Spanish and Portuguese part derives from rich fauna and flora and the beautiful landscape that has a remarkable cultural, scientific and tourist value.[454] Many people still earn their living from fishing and the harvesting of shellfish.[455] In that respect, the coastal communities are dependent upon soundly managed and protected marine ecosystems. Despite opposition against the initial

[445] The Nature Conservancy, "Paracas National Reserve", available from <http://parksinperil.org/wherewework/southamerica/peru/protectedarea/paracas.html>; (accessed on 30 September 2006).

[446] MEPC 48/7, *Designation of the marine area of the Paracas National Reserve as a "particularly sensitive sea area"*, 18 April 2002, annex, p. 2 et seqq.

[447] MEPC 48/7, *supra*, note 446, annex, para. 2.1.1.5.

[448] Cf. MEPC 49/22, *supra*, note 145, para. 8.7.

[449] Res. MEPC.121(52), *Designation of the Western European Waters as a Particularly Sensitive Sea Area*, adopted on 15 October 2004.

[450] See Markus Detjen, *supra*, note 140, pp. 442-453; and Julian Roberts et al., *supra* note 176, pp. 431-440.

[451] MEPC 49/8/1, *supra*, note 142, Annex 1, para. 3.1.3.

[452] *Ibid.*, para. 3.1.6.

[453] *Ibid.*, para. 3.1.9 et seq.

[454] *Ibid.*, para 3.1.13.

[455] WWF, "The Prestige: One Year on – a Continuing Disaster", available from <http://www.panda.org/downloads/marine/finalprestige.pdf>; (accessed 30 September), p. 6; MEPC 49/8/1, *supra*, note 142, Annex 1, para. 3.3.1.13.

application, it received approval in principle by MEPC 49.[456] MEPC 52 felt able to award final designation.

MEPC received three PSSA application prior to its 51st session concerning the designation of the *Canary Islands* of Spain, the *Galapagos Islands* of Ecuador and the *Baltic Sea Area*.

The Canary Islands form an archipelago of volcanic origin off the west coast of Africa, near or on some of the main routes for vessels sailing from Europe to Africa, Asia or South America. Some of the islands, such as La Palma and Lanzarote, have been declared a biosphere reserve. The waters around the islands host a wide variety of ecosystems. Over 12,000 species have so far been discovered on or around the Canary Islands, 64 per cent of which are flora, 29 per cent fauna and 7 per cent fungi.[457] The waters are both important habitats and breeding grounds for marine mammals, such as the bottleneck dolphin and the Atlantic loggerhead sea turtle, and many bird species. Fishing and fish farming are valuable industries, as the region is especially rich in tuna. MEPC has recognised the particular sensitivity of the Canary Islands and designated the PSSA in principle at its 51st session. MEPC 53 granted final designation.[458]

The Galapagos Islands are an archipelago comprising 19 islands and several islets of volcanic origin, which lie about 500 nm off the Ecuadorian mainland.[459] Due to their equatorial setting and geographical isolation, the Galapagos Islands have developed several unique features, including a rich flora and fauna, a high degree of endemism and high phyto- and zoogeographical affinity.[460] They provide a habitat for an abundant number of species; for many of them, for instance green turtles and marine iguana, as well as Galapagos penguins and flightless cormorants, the islands represent the only natural refuge and breeding ground. As many species are restricted to the islands, a shipping accident involving a spill of hazardous cargo would lead to disastrous consequences. The archipelagic waters are quite shallow, a fact that further increases the archipelago's vulnerability. The archipelago is not only protected by domestic law, but also by several international mechanisms, such as the UNESCO MAB Programme.[461] Since only IMO is able to provide protection against threats posed by global shipping, Ecuador came forward in 2003 with a proposal to MEPC 51 to have the Galapagos Islands designated as a PSSA. Upon recommendation by the

[456] Cf. MEPC 49/22, *supra*, note 145, para. 8.25.2.
[457] MEPC 51/8, *Designation of the Canary Islands as a Particularly Sensitive Sea Area*, 24 October 2003, annex, para. 3.1.2.1. More than 3,500 of these species are endemic.
[458] Res. MEPC.134(53), *Designation of the Canary Islands as a Particularly Sensitive Sea Area*, adopted on 22 July 2005.
[459] MEPC 51/8/2, *Designation of the Galapagos Archipelago as a Particularly Sensitive Sea Area*, 24 December 2003, para. 2.1. For a chart of the archipelago, see MEPC 51/8/2/Corr.1, *Designation of the Galapagos Archipelago as a Particularly Sensitive Sea Area – Corrigendum*, 17 February 2004, annex.
[460] MEPC 51/8/2, *supra*, note 459, para. 3.1.1. et seq.
[461] MEPC 51/8/2, *supra*, note 459, para. 5.2.

Informal Technical Group (ITG)[462], MEPC 51 designated the area in principle. MEPC 53 granted final designation.[463]

The Baltic Sea Area PSSA comprises, to avoid any misunderstanding, the Baltic Sea except waters under Russian jurisdiction. Even though these parts share the ecological characteristics of the Baltic Sea as a whole, the Russian Federation refrained from having them included in the application. Accordingly, the proposal was submitted by the remaining littoral states of the Baltic Sea, i.e. Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland and Sweden.[464] The Baltic Sea is a cold, northern brackish-water eco-system, which is, especially because of its shallow waters, vulnerable to the impact of international shipping and other human activities.[465] It is a semi-enclosed sea with an exceptionally low salinity, especially in the eastern and northern parts. Its catchment area is four times larger than its basin area, thus freshwater inflow is high, while saline water inflow is constrained by the narrow Danish straits. The special salinity conditions result in low species diversity. Still, the Baltic Sea's biodiversity is considered to be unique, since only a small number of species have been able to adapt to the brackish-water conditions and form a fragile ecosystem.[466] In addition, the Baltic Sea coastal regions host important habitats for numerous sea birds and waterfowl.

The proponents introduced their application to the MEPC at its 51st session. The Russian Federation, in particular, voiced pronounced opposition, expanding on their views already expressed with respect to the Western European PSSA proposal. It reiterated its stance that PSSA designation should be limited to small areas.[467] Moreover, protection granted by both global and regional international law through MARPOL and HELCOM respectively was sufficient, especially in light of the fact that 90 per cent of the pollution of the Baltic Sea comes from land-based sources.[468] In addition, it felt that the proposing states were under the obligation to submit a joint application supported by all littoral states.[469] Nevertheless, members of MEPC felt able to grant designation to the proposed area. Approval in principle was given at MEPC 51 and final designation granted at MEPC 53.[470]

As has become apparent, the PSSAs designated to date differ considerably with respect to, *inter alia*, size and ecological attributes. The most contentious appli-

[462] Cf. MEPC 51/WP.9, *supra*, note 192, para. 2.4.
[463] Res. MEPC.135(53), *Designation of the Galapagos Islands as a Particularly Sensitive Sea Area*, adopted on 22 July 2005.
[464] MEPC 51/8/1, *supra*, note 377.
[465] MEPC 49/8/3, *The Baltic Sea – a globally unique and vulnerable sea area*, 8 May 2003, para. 2.4 et seq. and para. 3.
[466] MEPC 51/8/1, *supra*, note 377, para. 3.1.
[467] For an account of the Russian Federation's position on PSSA designations, see Hugh O'Mahony, *supra*, note 159, p. 3. I have commented on the Russian argument, *supra*, in Sec. II.3. of Chapter 7.
[468] MEPC 51/22, *supra*, note 148, para. 8.27.
[469] This issue has already been addressed, *supra*, in Sec. II.5.b) of Chapter 7.
[470] Res. MEPC.136(53), *Designation of the Baltic Sea Area as a Particularly Sensitive Sea Area*, adopted on 22 July 2005.

cations for PSSA status were the Western European PSSA and the Baltic Sea Area PSSA, where both vessel traffic intensity and environment protection interests are very high. Yet no application has been rejected entirely so far. Two proposals, however, have not been followed up by proposing states.

The first concerns a proposal to designate as a PSSA the Gulf of Aqaba and the Strait of Tiran (Egypt). Initially, Egypt submitted an application to the NAV sub-committee in 1994, which found itself not competent to deal with such a proposal and instructed Egypt to submit an application to MEPC.[471] The proposal that was submitted to MEPC five years later included three ATBAs and "precautionary measures" in the region "from Taba to Nuweiba Port, from Nuweiba Port to the Northern Limits of Abou Galum protected and Jazirat Tiran."[472] MEPC instructed Egypt to provide more substantive information on the ecological characteristics of the area and Egypt promised to act accordingly.[473] However, instead of a further submission by Egypt, Israel responded in a document submitted to MEPC 45.[474] It argued that approval of the ATBAs would be an undue restriction on navigation and would hamper access to the Israeli Port of Eilat. The proposal would thus violate respective provisions of the 1979 Peace Treaty between Israel and Egypt.[475] Probably due to the political frictions it would have caused, the application was not followed up by Egypt within the context of IMO.

Another application concerns parts of the Argentinean coast, for which protective measures were sought at MEPC 43.[476] Even though Argentina clarified that its submission was based on the 1991 Guidelines and that the proposed areas "should not be interpreted as, nor are they intended to be, special areas as set out in MARPOL 73/78", the exact purpose of the Argentinean initiative did not become clear immediately.[477] There seemed to be a misunderstanding on the side of Argentina as to what a PSSA is and what the application procedure was like. So far, Argentina has not initiated any further action.

Other states that have announced their interest in proposing further PSSAs over the course of the years[478] have not yet come forward with an application but it is

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[471] Angelo Merialdi, *supra*, note 254, pp. 19-43, at 39, note 22, with reference to NAV 40/4/3 of 8 June 1994.

[472] MEPC 43/6/1, *Areas to be avoided and precautionary measures in particularly sensitive sea areas in the region of the natural protected areas from Taba to Nuweiba Port, from Nuweiba Port to the Northern Limits of Abou Galum protected and Jazirat Tiran*, 30 March 1999. The ATBAs were envisaged to apply to "any vessel carrying dangerous or toxic cargoes, or to any other vessel exceeding 500 gross tonnes".

[473] Cf. MEPC 43/21, *supra*, note 430, para 6.26.

[474] MEPC 45/6/1, *Identification and Protection of Special Areas and Particularly Sensitive Sea Areas*, 3 July 2000.

[475] MEPC 45/6/1, *supra*, note 474, para. 4.

[476] MEPC 43/6/5, *Special protection areas on the Argentina coast, routeing of ships carrying oil and noxious liquid substances (NLS)*, 1 April 1999.

[477] MEPC hence "requested Argentina to provide clarification […] as to whether [it] is proposing an area to be avoided for oil tankers and chemical tankers." See MEPC 43/21, *supra*, note 430, para. 6.28.

[478] See, e.g. J. Ashley Roach, "Particularly Sensitive Sea Areas: Current Developments", in M. Nordquist, J.N. Moore and S. Mahmoudi (eds.), *The Stockholm Declaration and Law*

likely that further proposals will be submitted to MEPC in the future. The Norwegian Government, which had contemplated applying for large parts of the Barents Sea to be designated as a PSSA[479], eventually did not submit a respective proposal to MEPC. Instead, Norway decided to apply for a mandatory TSS. This proposal did not receive approval at NAV 52; NAV merely agreed to several recommendatory routeing measures.[480]

2. Approved APMs

Several APMs have been approved as ensuring appropriate protection of the designated areas from threats of damage posed by international shipping. In the following section, these APMs shall be introduced in varying detail, depending on their legal importance.

For the *Great Barrier Reef (GBR) PSSA*, two mandatory APMs were approved in 1991 alongside the designation. The first is compulsory pilotage for the inner route of the GBR, the other is a mandatory ship reporting system covering both the reef and the Torres Strait.[481] The latter applies to "all ships of 50 m or greater in overall length; […] all ships, regardless of length, carrying in bulk hazardous and/or potentially polluting cargo, in accordance with the definitions at resolution MSC.43(64), paragraph 1.4; [… and] ships engaged in towing or pushing where either the towing or pushing vessel or the towed or pushed vessel is a vessel prescribed within the [first two] categories."[482] Furthermore, IMO recommended governments should encourage compliance with a pilotage scheme that Australia has introduced for the outer route of the GBR, which is located in the EEZ.[483] The *Torres Strait PSSA* extension is protected by a recommended two-way route[484] and by a pilotage scheme whose use IMO, after controversial debate[485], agreed to recommend "strongly" instead of making it compulsory.[486] As a further APM,

of the Marine Environment (The Hague Boston London: Kluwer Law International 2003), pp. 311-321, at 316 et seq.

[479] First Joint Ministerial Meeting of the Helsinki and Ospar Commissions, *Declaration*, Bremen, 25-26 June 2003, available from <http://www.helcom.fi/ministerial_declarations/en_GB/ospardeclaration/>; (accessed 30 September 2006), para. 30 lit. h.

[480] See documents cited in note 300 of this chapter.

[481] Res. MSC.52(66), *Mandatory Ship Reporting System "The Torres Strait and Inner Route of the Great Barrier Reef"*, adopted 30 May 1996, as amended by Res. MSC. 161(78), *Amendments to the Existing Mandatory Ship Reporting System "The Torres Strait and Inner Route of the Great Barrier Reef"*, adopted on 17 May 2004.

[482] Res. MSC.52(66), *supra*, note 481, Annex 1, para. 1.3.

[483] Res. MEPC.45(30), *Recommended Use of Pilots*, adopted on November 1990. The use of pilots was made compulsory under domestic law and has since then been enforced accordingly.

[484] The coordinates defining the two-way route are set forth in Res. MEPC.133(53), *supra*, note 414, Annex 2. MSC approved the measure in 2004, cf. MSC 78/26/Add.2, *supra*, note 299, Annex 22, p. 1 et seq.

[485] See, *supra*, Sec. II.1.d) of this chapter and, *infra*, Sec. V.3. of this chapter.

[486] The application for compulsory pilotage is contained in NAV 50/3, *supra*, note 150.

MSC approved amendments to the existing mandatory SRSs of the GBR PSSA to allow for its application in the Torres Strait PSSA.[487]

The *Sabana-Camagüey Archipelago PSSA,* as the most important part of the Cuban MPA network, was already protected under domestic Cuban law, and it is covered by the MARPOL Annex V special area "Wider Caribbean Region." As far as shipping activities are concerned, MSC 48 had already approved recommendatory TSSs to protect the area.[488] One year after the PSSA was identified without additional APMs, Cuba submitted a proposal for several new APMs to MEPC 42.[489] Cuba's proposal primarily aimed to restrict discharges of any kind in and around the waters of the Sabana-Camagüey archipelago, all of which are either internal waters or territorial sea.[490] As became apparent during the review process at MEPC 42, most of the measures sought did not go beyond standards already available under MARPOL, such as the prohibition of all operational discharges from oil tankers within 50nm measured from the base line. Other proposed discharge restrictions, e.g. discharge of ships' ballast water, were in line with IMO regulations in force at the time, or, like the prohibition of discharging TBT, within the competence of coastal states under Article 21 of UNCLOS.[491] MEPC thus did not forward these proposals to another committee for examination but granted immediate approval.[492] Another proposed APM was a voluntary ATBA between the access routes to the ports of Matanzas and Cárdenas.[493] The application was forwarded to NAV 45, where it received unanimous support.[494] The scope of the routeing measure was determined to apply to "all ships over 150 gross tonnage, for reasons of conservation of unique biodiversity, nature and beautiful scenery."[495]

The sole APM of *Malpelo Island PSSA* is a recommendatory ATBA that applies to "all fishing vessels and all other ships in excess of 500 gross tonnage."[496] Colombia thereby attempted to limit the impacts of illegal fishing, which had caused a significant decline in the size of fish stocks around Malpelo

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[487] See Res. MSC.161(78), *Amendments to the Existing Mandatory Ship Reporting System in the Torres Strait and Inner Route of the Great Barrier Reef*, adopted on 17 May 2004, annex.

[488] See MEPC 43/6/4, *Revision of Resolution A.720(17)*, 2 April 1999, annex, para. IV.

[489] MEPC 42/10/3, *Measures of protection envisaged for the Sabana-Camagüey Archipelago*, 4 September 1998.

[490] Cf. Kristina M. Gjerde and J. Sian H. Pullen, *supra*, note 422, p. 250; and Kristina M. Gjerde, *supra*, note 351, p. 417 et seq.

[491] See, in more detail, Kristina M. Gjerde, *supra*, note 351, *loc.cit.*

[492] MEPC 42/22, *Report of the Marine Environment Protection Committee on its Forty-Second Session*, 16 November 1998, para 10.17.

[493] NAV 45/3/6, *Area to be avoided on the northern coast of Cuba*, 2 July 1999. A chart of the ATBA is reproduced in the annex of the document.

[494] NAV 45/14, *Report to the Maritime Safety Committee*, 25 October 1999, Annex 3.

[495] *Ibid.* Subsequent developments in the Sabana-Camagüey Archipelago PSSA are summarised in a statement by Cuba reproduced in MEPC 46/23, *supra*, note 432, Annex 13, para 4.

[496] Cf. MSC 75/24/Add.1, *Report of the Maritime Safety Committee on its Seventy-Fifth Session*, 31 May 2002, Annex 7, p. 2 et seq.

Island. The proposal for the ATBA had not been included in initial applications to MEPC 43 and 44.[497] As more information was requested by MEPC 44 on, *inter alia*, APMs for the area, to facilitate decision on the PSSA application, Colombia proposed establishing an ATBA to MEPC 46[498], which was then forwarded to NAV 47. NAV considered the application, endorsed it and again forwarded it to MSC 75, where it received final approval.[499]

The *Florida Keys PSSA* is protected by several different routeing measures: four recommendatory ATBAs and three mandatory no-anchoring areas. The ATBAs were already established by IMO in 1991 and were meant to protect vulnerable parts of the fragile coral reef system off the coast of Florida. Compliance was recommended "for all vessels carrying cargoes of oil and other hazardous material and all other vessels greater than 50 meters in length."[500] During the process of preparing the PSSA application, the US reviewed the ATBA boundaries and, as a result, submitted a proposal to amend the northernmost ATBA to gain better protection against groundings.[501] This proposal was approved by NAV 47. The no-anchoring areas, proposed for application in the Tortugas Ecological Reserve[502], represented an innovative instrument at the time they were contemplated. IMO had only amended the GPSR to allow for the establishment of no-anchoring areas a few months before the proposal was submitted. MSC 75 approved all proposed APMs[503] without extensive discussion.[504]

The *Wadden Sea PSSA* was approved without any additional APM. Existing protective measures include coverage of the area by MARPOL special-area designations restricting discharges according to standards contained in Annexes I and V.[505] Routeing systems established in the area are several TSSs and a mandatory deep-water route in the German bight adjacent to the German and Dutch

[497] MEPC 43/6/7, *supra*, note 429; MEPC 44/7, *Designation of Malpelo Island as a "particularly sensitive sea area"*, 3 December 1999.

[498] MEPC 46/6/3, *supra*, note 427.

[499] Vladimir Kotliar, "Marine Protected Areas on the High Seas (some legal aspects)", in H. Thiel and J.A. Koslow (eds.), *supra*, note 254, pp. 143-148, at 146, has expressed serious concerns about the approval given to the proposed ATBA. In his view (which unfortunately seems to be corroborated by wrong information), it represents a development that takes the trend to protection by a "broad, comprehensive and integrated approach […] across all reasonable limits".

[500] MSC 75/24/Add.1, *supra*, note 496, Annex 7, p. 2.

[501] NAV 47/3, *Amendment of the Northernmost area to be avoided off the Florida Coast*, 15 February 2001.

[502] NAV 47/3/1, *No anchoring areas in the Tortugas Ecological Reserve and the Tortugas Bank in the Florida Keys*, 15 February 2001.

[503] MSC 75/24/Add.1, *supra*, note 496, Annex 7.

[504] Cf. MSC 75/24, *Report of the Maritime Safety Committee on its Seventy-Fifth Session*, 29 May 2002, para. 6.7.

[505] Stricter air pollution standards for ships in SECAs pursuant to MARPOL Annex VI will become effective for the North Sea (and thus also for the Wadden Sea) by November 2007, cf. MEPC 53/24, *supra*, note 28, para. 5.11.

Wadden Sea (off the Frisian Islands in the North Sea).[506] Moreover, there are several VTSs covering different parts of the area, and a voluntary deep-sea pilotage scheme from the North Hinder to the German Bight.[507]

Regarding protection of the *Paracas National Reserve PSSA*, four TSSs had already been approved prior to the PSSA designation for the approach to ports in the vicinity of the designated area.[508] When applying for PSSA status for the Paracas National Reserve, Peru proposed having parts of the area covered by an ATBA and applying strict discharge restrictions to the entire area.[509] As concerns the ATBA, Peru was requested to submit a separate proposal to the NAV sub-committee. It did so several years later; a respective application for a recommendatory ATBA was finally approved by MSC 78.[510] It applies to "ships of more than 200 gross tonnage carrying hydrocarbons and hazardous liquids in bulk."[511] With respect to the second proposed APM, a "no-discharge area", Peru was asked to provide more information, as MEPC considered the proposal to be inadequately corroborated by the presented data. No further action has been taken until today.

As has been said earlier, the designation of the *Western European Waters PSSA* caused considerable disturbance, due to the originally proposed APM, which would have effectively banned single-hull oil tankers from sailing through the area. In the event, only one APM application was retained: a mandatory SRS applicable to "[e]very kind of oil tanker of more than 600 tonnes deadweight" carrying certain specified oily cargoes. The system called WETREP (*West European Tanker Reporting System*) entails a reporting obligation for tankers carrying certain oily cargoes 48 hours before entering the area. It was approved by MSC 79.[512] Existing IMO measures already in place to protect the area from threats posed by international shipping comprise recommendatory routeing measures, such as ATBAs, TSSs and deep-water routes and VTSs/SRSs for some smaller parts of the PSSA.[513]

For the *Canary Islands PSSA,* three recommendatory TSSs were approved alongside accompanying routeing measures, such as precautionary areas and in-shore traffic zones.[514] In addition, a mandatory SRS (CANREP) was established,

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[506] See, *supra*, note 295 for relevant documents. The measure must be complied with by vessels of 10,000 tons gross tonnage and upwards, carrying oil, liquefied gases in bulk or noxious liquid substances falling under categories C or D of MARPOL Annex II. The threshold for ships carrying noxious liquid substances falling under categories A or B of MARPOL Annex II is reduced to 5,000 tons.

[507] For an overview of existing APMs, see Res. MEPC.101(48), *supra*, note 437, Annex 3.

[508] MEPC 48/7, *supra*, note 446, annex, para. 9.7.

[509] MEPC 48/7, *supra*, note 446, annex, para. 5 et seqq.

[510] MSC 78/26/Add.2, *supra*, note 299, annex 22, p. 3.

[511] *Ibid.*

[512] Res. MSC.190(79), *Adoption of Mandatory Ship Reporting System in the Western European Particularly Sensitive Sea Area*, adopted on 6 December 2004.

[513] For an overview, see Res. MSC.190(79), *supra*, note 512, p. 6 et seq.

[514] Res. MEPC.134(53), *supra*, note 458, Annex 2, para. 1 et seqq.; as approved by MSC, cf. MSC 81/25/Add.2, *Report of the Maritime Safety Committee on its Eighty-First Session*, 1 June 2006, Annex 27.

in which vessels of 600 deadweight tonnage and upwards carrying certain oil cargoes must take part.[515] IMO furthermore approved the establishment of four recommendatory ATBAs, two of which are breeding grounds for cetaceans and two are internationally recognised as biosphere reserves.[516] These areas should be avoided by transiting ships carrying oily or other hazardous cargo in bulk.

The *Galapagos Islands PSSA* was designated even before the Assembly decided on a recommendatory ATBA as its APM.[517] The ATBA should be avoided by "[a]ll ships and barges carrying cargoes of oil or hazardous material and all ships of 500 gross tonnage and above solely in transit should avoid the area."[518] Interestingly, the ATBA's limits exceed the boundaries of the PSSA.[519] Ecuador expressly referred to the buffer-zone concept of the PSSA Guidelines to justify the extended size.[520] In the initial application to IMO, Ecuador had requested the organisation also to approve a ban on discharges and dumping of any substance, as well as a ban on ballast-water exchange.[521] However, it seems that Ecuador has not followed up the establishment of this particular APM as an IMO measure. Its examination is not mentioned in any of the MEPC documents dealing with the PSSA application.[522] Ecuador's submission to MSC, and NAV accordingly, may provide an explanation for that. While Ecuador retained its comprehensive bans on discharges, dumping and ballast-water exchange, it lists them as *domestic* measures – applied to both Ecuadorian and third-state ships – designed to support the ATBA's efficiency.[523] IMO member states, in considering Ecuador's submission, have probably tolerated this approach, since the geographical scope of application is limited to archipelagic waters and the territorial sea (where Ecuador has sufficient prescriptive competence), as was the case with

[515] CANREP was established by Res. MSC.213(81), *Mandatory Ship Reporting System for the Canary Islands*, adopted on 12 May 2006. For details, see Annex 1 of the Resolution.

[516] Cf. Res. MEPC.134(53), *supra*, note 458, Annex 2, Part B; and MSC 81/25/Add. 2, *supra*, note 514, Annex 28.

[517] Res. A.976(24), *Ships' Routeing – Establishment of an Area to be Avoided in the Galapagos Archipelago*, adopted on 1 December 2005. Prior to the Assembly's decision, the ATBA was approved by NAV 51 and forwarded to the Assembly, "as authorized by MSC 80", cf. NAV 51/19, *supra*, note 223, para. 3.20 et seqq. and 3.48; a draft resolution is contained in Annex 5 of the said report.

[518] Res. A.976(24), *supra*, note 517.

[519] See charts of PSSA and ATBA, MEPC.135(53), *supra*, note 463, Annex 2.

[520] NAV 51/3/4, *Proposal by Ecuador to designate the Galapagos Archipelago as a Particularly Sensitive Sea Area (PSSA)*, 4 March 2005, Annex 5.

[521] These APMs were part of the original application, cf. MEPC 51/8/2, *supra*, note 459, para. 5.3.1.1.

[522] Cf. MEPC 51/22, *supra*, note 148, para. 8.45; The review form of the ITG of MEPC 51 merely examines the ATBA proposal: MEPC 51/WP.9, *supra*, note 192, Annex 2, para. 5.2.

[523] MSC 80/23/7, *Proposal by Ecuador to designate the Galapagos Archipelago as a Particularly Sensitive Sea Area (PSSA)*, 4 March 2005, annex, p. 2; NAV 51/3/4, *supra*, note 520, Annex 10, p. 2.

similar measures in the Sabana-Camagüey Archipelago PSSA.[524] Consequently, there was no discussion on this issue[525] and the final wording of the resolution approving the APM does not refer to anything else but the ATBA. Ecuador has furthermore submitted a proposal for a mandatory SRS ("GALREP") for ships entering the PSSA to NAV 52[526], where it received initial approval.[527] It also notified the sub-committee of the establishment of two mandatory TSSs for vessels approaching ports in the Galapagos archipelago.[528]

The *Baltic Sea Area PSSA* is primarily protected by measures that were already in place at the time the area was granted its special status by MEPC. Existing APMs include MARPOL special- area restrictions pursuant to Annexes I, II, V and VI, mandatory SRSs in some parts[529], several routeing systems and localised compulsory pilotage schemes.[530] As the PSSA application did not include proposals for new APMs, proponents of the PSSA application had promised MEPC that they would come forward with further APMs at a later stage.[531] The 24th meeting of the Assembly was able to approve new and amended routeing measures, including several TSSs and accompanying routeing measures; a deep-water route off Gotland Island; and two ATBAs.[532] These measures were already included in the resolution designating the PSSA noting the necessity to gain approval of the assembly. Since several other measures were contemplated for

[524] See above in this section.
[525] NAV 51/19, *supra*, note 223, para 3.20 et seqq.
[526] NAV 52/3/1, *GALREP Mandatory Ship Reporting System for the Galapagos Area to be Avoided and PSSA*, 17 February 2006.
[527] Draft resolution is contained in NAV 52/18, *supra*, note 300, Annex 3. Formal approval will be given by MSC.
[528] NAV 52/3, *Ships' Routeing System for the Galapagos Area to be Avoided and PSSA*, 17 February 2006, annex 2. The sub-committee did not forget to note that Ecuador would be well-advised to submit a proposal for the adoption of these TSSs to IMO to have the measures marked on international charts and included in the GPSR appendix; cf. NAV 52/18, *supra*, note 223, para. 3.22.
[529] For instance, SRS "In the Great Belt Traffic Area", recently amended by Res. A.978(24), *Amendments to the Existing Mandatory Ship Reporting System "In the Great Belt Traffic Area"*, adopted on 1 December 2005.
[530] For an overview, see MEPC 51/8/1, *supra*, note 377, para. 5.2 et seqq.
[531] In fact, as was mentioned at MSC 80, proponents of the PSSA designation had realised "that proposed Associated Protective Measures had been submitted directly to NAV 51 (NAV 51/3/6), but unfortunately without being submitted to the Committee." Cf. MSC 80/24, *Report of the Maritime Safety Committee on its Eightieth Session*, 24 May 2005, para. 23.23. MSC instructed and authorised NAV to consider the proposed measures and to forward them directly to the Assembly.
[532] Res. A.977(24), *Ships' Routeing*, adopted on 1 December 2005. A proposal to make the ATBAs mandatory was rejected by MSC and NAV. See, *infra*, sec. V.3. of this chapter. The Assembly also amended the existing mandatory SRS "In the Great Belt Traffic Area"; cf. Res. A.978(24), *Amendments to the Existing Mandatory Ship Reporting System "In the Great Belt Traffic Area"*, adopted on 27 January 2006.

future initiatives[533], it is highly likely that Baltic Sea riparian states will come forward with further APM proposals in the near future.

3. Rejected APMs

While no PSSA application has yet been entirely rejected, some APM proposals have, for different reasons, in fact been turned down. In the following section I shall briefly illuminate the background of these incidents, which have already been mentioned earlier in this treatise. Looking at APMs for which approval was not granted, it is apparent that they were always addressed by a mixture of open opposition and diplomatic compromise.

Rejected APMs encompass Compulsory Pilotage for the Torres Strait PSSA, a single-hull oil tanker ban for the Western European PSSA, "no-discharge areas" for the Sabana-Camagüey Archipelago PSSA, as well as for the Paracas National Reserve PSSA, and mandatory ATBAs for the Baltic Sea Area PSSA. The compulsory pilotage scheme and the single-hull tanker ban were fiercely opposed by those interested in unimpeded freedom of navigation. Despite opposition at MEPC 49, the former proposal was upheld by Australia and Papua New Guinea to have it scrutinised by both MSC and NAV. On this occasion, it became apparent that neither proponents nor opponents of the measure would give up their positions. Hence, it was informally agreed to consent to "strong recommendation" of the instrument. In notable difference, the latter proposal was withdrawn at the same MEPC session at which it was proposed.[534] By threatening unilateral enforcement of the ban, proponents of the application brought IMO member states to agree to tougher global MARPOL regulations addressing the phase-out of single-hull tankers. Since they had achieved an adequate substitute, proposing states felt able to withdraw their APM proposal.

Two mandatory APMs were proposed for the Baltic Sea Area PSSA, both of which would have been located in the Swedish EEZ. It was jointly proposed by all proponents of the Baltic Sea Area PSSA, who argued for approval because of the exceptional sensitivity of the two areas.[535] Despite information assembled for the

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[533] Cf. MEPC 51/8/1, *supra*, note 377, para. 5.10 et seqq. Environmental NGOs have also suggested further APMs, cf. MEPC 51/8/5, *Designation of the Baltic Sea area as a PSSA – Comments on Document 51/8/1*, 6 February 2004, submitted by WWF; and MEPC 51/8/6, *Comments on the submission by Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland and Sweden*, 6 February 2004, submitted by Greenpeace International. Refer furthermore to plans pronounced by Poland, NAV 52/Inf.5, *Information about planned new routeing measures in the southern part of the Baltic Sea*, 12 May 2006.

[534] It should be noted that the proposal may have been based on a single-hull tanker ban, which was contemplated for application in the GBR PSSA, see Peter Ottesen, Stephen Sparkes and Colin Trinder, *supra*, note 119, p. 521.

[535] NAV 51/3/6, *New traffic separation schemes in Bornholmsgat and North of Rügen, recommended deep-water route in the eastern Baltic Sea, amendments to the traffic separation schemes Off Gotland Island and South of Gedser and new areas to be avoided at Hoburgs Bank and Norra Midsjöbanken*, 8 June 2005, para. 23 et seqq. Note

proposal, NAV's Working Group on Ships' Routeing and Related Matters merely held "that the proposal did not justify the establishment of such areas."[536] The sub-committee approved results of the WG without further comment.[537] Sweden, on behalf of the sponsors of the APM proposal, offered to come back with more information in support of the need to attach binding force to the routeing measures.[538] Apparently this did not happen at NAV 52 in June 2006.

Cuba's and Peru's proposal to have their PSSAs designated as "no-discharge areas" have been dealt with in a slightly different way. As regards the Cuban proposal, MEPC 42 did not forward the proposal to any other committee because it agreed to interpret the proposed ban as being in line with relevant MARPOL regulations after the Bahamas, in particular, objected to some of the rules.[539] By accepting this approach, Cuba's rules may have less force than was envisaged. Peru's proposal to prohibit any kind of discharge from ships within the sea area of the reserve, "including discharge of sewage and waste"[540] was examined at MEPC 48.[541] The IWG, after reviewing the proposal, contended that "the information provided was not sufficient to justify the approval of such an area at this session of the Committee."[542] There was no further submission of Peru on this matter at MEPC 49 or any of the following sessions. Peru had probably realised that the proposal had no chance of being approved.

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that in so doing, sponsoring states identified areas of *particularly sensitivity* within a *Particularly Sensitive* Sea Area. This conduct and its impact on the PSSA concept as a whole will be examined, *infra*, in Sec. II.1.a) of Chapter 11.

[536] NAV 51/WP.2, *Report of the Working Group*, 8 June 2005, para. 8.11.

[537] NAV 51/19, *supra*, note 223, para. 3.51.

[538] *Ibid*, para. 3.50.

[539] See Kristina M. Gjerde, *supra*, note 351, p. 418. The same procedural approach was deployed with respect to a comprehensive discharge and dumping ban in the Galapagos PSSA. However, no state had voiced any concerns with respect to the Ecuadorian proposal before.

[540] MEPC 48/7, *supra*, note 446, annex, para. 6.

[541] See MEPC 48/WP.14, *Report of the Informal Working Group*, 10 October 2002.

[542] MEPC 48/21, *Report of the Marine Environment Protection Committee on its Forty-Eighth Session*, 24 October 2002, para. 7.8.4.

4. Particularly Sensitive Sea Areas – Overview

Particularly Sensitive Sea Area	Date approved	Associated Protective Measures
Great Barrier Reef (Australia)	16 November 1990	Compulsory Pilotage (inner route) Recommended Pilotage (outer route) Mandatory Ship Reporting System
Torres Strait (Australia and Papua New Guinea)	2 July 2005	Recommended Pilotage Scheme Recommended Two-Way Route Mandatory Ship Reporting System
Sabana-Camagüey Archipelago (Cuba)	25 September 1997	MARPOL Annex V Special Area Recommended ATBA Two recommended Traffic-Separation Schemes
Malpelo Island (Colombia)	10 October 2002	Recommended ATBA
Florida Keys (Florida)	10 October 2002	Four recommended ATBAs Three mandatory No-Anchoring Areas
Wadden Sea (The Netherlands, Germany, Denmark)	11 October 2002	MARPOL Annex I and V Special Area Several recommended TSSs Mandatory Deep-Water Route Several Vessel Traffic Services Voluntary Deep-Sea Pilotage Scheme
Paracas National Reserve (Peru)	18 July 2003	Four recommended Traffic-Separation Schemes Recommended ATBA
Western European Waters (Portugal, Spain, France, Belgium, UK, Ireland)	15 October 2004	Several recommended Traffic-Separation Schemes and Vessel-Traffic Services Several recommended ATBAs Several recommended Deep-Water Routes Mandatory Ship Reporting System (WETREP)
Canary Islands (Spain)	22 July 2005	Three recommended Traffic Separation Schemes (with precautionary areas and inshore traffic zones) Mandatory Ship Reporting System Four recommended ATBAs
Galapagos Islands (Ecuador)	22 July 2005	Mandatory Ship Reporting System Several mandatory Traffic Separation Schemes Recommended ATBA
Baltic Sea Area (Denmark, Germany, Poland, Latvia, Lithuania, Estonia, Finland, Sweden)	22 July 2005	MARPOL Annex I, II, and V Special Area SO_x Emissions Control Area Localised mandatory Ship Reporting Systems Several recommended Traffic Separation Schemes Recommended Deep-Water Route Localised recommended pilotage schemes