Confirmed Minutes of the 97th Meeting of the Environmental Impact Assessment Subcommittee of the Advisory Council on the Environment held on 19 March 2007 at 3:30 pm

Present:

Dr NG Cho-nam, BBS (Chairman)
Dr Dorothy CHAN, BBS
Ms Betty HO
Prof Paul LAM
Mr Edwin LAU
Dr MAN Chi-sum, JP
Prof POON Chi-sun
Mr Simon WONG
Dr YAU Wing-kwong
Prof LAM Kin-che, SBS, JP (ACE Chairman and non-EIASC Member)
Ms Josephine CHEUNG (Secretary)

Absent with Apologies:

Mr TSANG Kam-lam (Deputy Chairman)

In Attendance:

Mr Carlson K S CHAN	Deputy Director of Environmental Protection (4), Environmental Protection Department (EPD)
Mr Elvis AU	Assistant Director (Environmental Assessment), EPD
Mr C C Lay	Assistant Director (Conservation), Agriculture, Fisheries and Conservation Department (AFCD)
Miss Sarah NG	Executive Officer (CBD), EPD

In Attendance for Agenda Item 3:

Mr Simon HUI	Principal Environmental Protection Officer (Regional Assessment), EPD
Colin KEUNG	Senior Environmental Protection Officer (Regional Assessment)2, EPD
Dr John WRIGLEY	Senior Environmental Protection Officer (Regional Assessment)5. EPD
Mr Albert TANG	Principal Assistant Secretary for Economic Development & Labour (Economic Development) A1, Economic Development and Labour Bureau

Dr Shane LO	Senior Divisional Officer (Dangerous Goods Division), Fire Services Department (FSD)
Mr LEUNG Kwok-kin	Assistant Divisional Officer (Dangerous Goods Division), FSD
Mr CHAN Ho-tak	Acting Assistant Divisional Officer (Planning Group), FSD
Mr Joseph SHAM	Senior Marine Conservation Officer, AFCD
Dr Ivan CHAN	Marine Conservation Officer, AFCD

****

Action

Agenda Item 1: Confirmation of Minutes of the 96th Meeting held on 19 January 2007

The draft minutes were confirmed without amendments.

Agenda Item 2: Matters Arising from the Minutes of the 96th Meeting held on 19 January 2007

2. There were no matters arising from the minutes of the last meeting.

Agenda Item 3: Environmental Impact Assessment Report on Permanent Aviation Fuel Facility for Hong Kong International Airport
(ACE-EIA Paper 3/2007)

Internal Discussion Session

3. A Member declared that the Friends of the Earth (Hong Kong) in which he served as the Director had worked with the Airport Authority Hong Kong (AA), the project proponent, in recycling their foam packaging waste on a regular basis. The Chairman suggested and Members agreed that the Member could stay and continue to take part in the discussion in view of his relatively indirect relationship with the project proponent.

4. The Chairman said that a total of 1,094 numbers of comments on the EIA report received by the Environmental Protection Department (EPD) had been referred to Members for reference before the meeting. Most of the comments were in the format of standard letters or emails. Upon the Chairman's enquiry, Mr Elvis Au said that about 1,200 numbers of public comments were received by EPD as at the date of the meeting. The key issues raised included hazard to life, site search and selection, marine ecology and

land use planning.

5. The Chairman informed Members that two sets of public comments directly addressed to the Council had also been circulated to Members for information before the meeting. A set of comments from the Shiu Wing Steel Limited (SWS) directly addressed to the Council was received on the date of the meeting and therefore was tabled at the meeting for Members' reference. In view of the length of the document, he suggested and Members agreed that the meeting set aside some time for Members to go through the comments. He highlighted that this was an extraordinary arrangement. Under the EIA Ordinance, public comments would be considered by the Director of Environmental Protection (DEP) and neither the ACE nor EIA Subcommittee was under any obligation to receive and deal with them. ACE was one of the statutory consultees. The comments received by EPD were referred to Members for reference. Members noted that the three sets of comments directly addressed to the Council were also addressed or copied to EPD.

6. The Chairman said that some Members had raised some written questions to the project proponent. The response from the project proponent had been circulated to Members before the meeting.

7. Members noted that the EIA report was a revised EIA report and not a fresh submission. They agreed that it was important to take note of the background of the EIA report in examining the revised EIA report. Mr Elvis Au said that an EIA report for the project had been discussed at the 72nd meeting of the EIA Subcommittee on 8 July 2002 and endorsed by the ACE on 29 July 2002 with a set of conditions. The EIA report was approved by the DEP and an Environmental Permit (EP) granted under the EIA Ordinance to construct and operate the project in August 2002. When the Council endorsed the EIA report on the temporary Aviation Fuel Receiving Facility (AFRF) sited off Sha Chau in 1995, one of the conditions was that the construction of the permanent pipeline would be expedited. The Chairman said that the project proponent had updated the Council since 1996 on the site search and site selection process to replace the existing temporary AFRF. The Council was briefed of the development and identification of Tuen Mun Area 38 as the preferred site option for the Permanent Aviation Fuel Facility (PAFF). After the endorsement of the EIA report on PAFF in 2002, the Council was kept informed of the results of the bubble jacket noise attenuation trial and test which was one of the conditions recommended by the Council and contained in the EP.

8. Mr Elvis Au said that SWS lodged a Judicial Review in November 2002 against the DEP's decisions. Both the Court of First Instance and the Court of Appeal ruled in favour of the DEP in September 2003 and

March 2005 respectively. On 17 July 2006, the Court of Final Appeal (CFA) overturned the decision of the Court of Appeal and set aside the judgment of the Court of First Instance. It ordered that the two decisions made by the DEP under the EIA Ordinance in August 2002 to approve the EIA report and to grant the EP for the project be quashed. In the light of CFA's judgment, AA submitted a revised EIA report in December 2006 based on the same EIA study brief and applied for approval under the EIA Ordinance.

9. Members agreed that it was important to take note of the major changes of the revised EIA report as compared with the previous EIA report submitted in 2002. Mr Elvis Au highlighted the following major changes –

(a) Hazard assessment – review of hazard assessment in the revised EIA report, including the quantitative risk assessment (QRA) of the hazard scenario of 100% instantaneous loss of a tank content, to address the issue raised by the CFA;

(b) Tank farm design and development – the total capacity of tank farm was reduced from 420,000 m^3 to 388,000 m^3. The tank height was reduced. Due to some land use changes, the whole site was shifted 10 m away from the building of SWS Mill. Additional safety features had been added to enhance security and safety, such as changing the outer security walls from wire mesh to impervious walls and equipping the bund with wave wall to enhance its wave protection capability. Moreover, an EcoPark, siting next to PAFF Tank Farm, was added in the revised EIA report as a major additional sensitive receiver;

(c) Mitigation measures to protect Chinese White Dophins (CWD) – additional measures were proposed to protect CWD, including the avoidance of dredging in CWD calving season from March to August (on top of avoidance of piling in CWD calving season) and imposition of 250 m CWD exclusion zone for the whole pipeline dredging (instead of only pipeline dredging within the marine park); and

(d) Approval from relevant authorities – approval had been obtained by the project proponent from relevant authorities for the construction works, including fire services installations, requirements under the Buildings Ordinance and Town Planning Ordinance.

Action

10. After discussion, the meeting agreed that the discussion should focus on site selection and marine transit as well as hazard assessment on tank farm.

(The project proponent team joined the meeting at this juncture.)

Presentation Session

11. Dr Neil Ketchell briefed Members on the background and purpose of the project as well as the findings of the EIA study with particular reference to the CFA judgment. Mr B S Chow informed Members that they had tabled for Members' information a set of responses to comments tabled by SWS at the Tuen Mun District Council meeting on 13 March 2007.

Question-and-Answer Session

Progress of the construction works

12. The Chairman enquired about the progress of construction works of the PAFF. Mr Amin Ebrahim said that some construction works had been undertaken from November 2005 after the decision of the Court of Appeal on the Judicial Review. These had been suspended following the judgment of the CFA of July 2006. Construction works completed during the period included site formation, foundations of six tanks, jetty piling, landscaping around the site and transplanting of trees.

Site selection and marine transit

13. Two Members expressed concern about the marine transport risk by using larger sized vessels. Dr Neil Ketchell explained that modelling results showed that the hazard range of a complete loss of the cargo of an 80,000 dwt vessel (the largest vessel calling at the PAFF) would not be much greater than that of a 5,000 dwt vessel currently used. The maximum vessel size of 80,000 dwt to be used for the project was quite modest in comparison with world-class vessels of up to about 550,000 dwt. In assessing the marine transport risk, it would be important to note the nature of aviation fuel Jet A1. Jet A1 was a type of clean fuel which would evaporate quickly. Unlike crude oil, it would not leave persistent oily residues. The use of larger sized vessels would reduce marine transport risk in Ma Wan Channel as a result of the reduced number of aviation fuel vessel movements from 1,100 to about 150 to 200 per year. The use of double-hulled vessels with advanced design, maneuvered by pilots and tug boats would further reduce the risk level.

Action

14. A Member enquired about the difference in the consequence of leakage of Jet A1 as compared with other liquid fuels during marine transit. Dr Neil Ketchell explained that the cargo tanks were specifically segregated in the tanker designs. The double hull design would make a complete loss of cargo unlikely to occur. The hazard level of Jet A1 and other liquid fuels was very different due to the very different nature of the products. When Jet A1 was spilled onto the sea, there would not be any flammable vapour and it would be extremely difficult to ignite it on sea surface. For crude oil, it would be quite easy to ignite it when it was initially poured onto the sea as it contained volatile fractions. However, this would not be the case if the crude oil had stayed long on the sea over a long period of time. For liquefied natural gas (LNG) and liquefied petroleum gas (LPG), it would take away the heat from the sea and vapourize almost immediately. When it vapourized, it would form gas clouds which were heavier than air and would likely drift over a long distance above the sea surface.

15. In reply to a Member's enquiry, Dr Neil Ketchell explained that Jet A1 was far more difficult to ignite than other liquid fuels. The minimum flash point of Jet A1 was 38 ℃ which was above the highest temperature recorded in Hong Kong based on metrological data. In comparison, the flash point of petrol was well below 0 ℃. If Jet A1 was heated in a furnace or a jet engine on an aircraft, flammable vapour would be produced. As stated in the EIA report, a fire would be expected if a pool of Jet A1 was poured into a furnace.

16. Mr Amin Ebrahim added that they had a site visit to the tank farm in the airport with members of the Tuen Mun District Council in 2002. They had demonstrated to the members how difficult it would be for Jet A1 to ignite.

17. A Member enquired about the consequence of a collision incident of a Jet A1 vessel with another vessel. Dr Neil Ketchell explained that it would unlikely set fire to it because the flash point of Jet A1 fuel was 38 ℃ which was above the ambient temperature. Moreover, it would be difficult for a collision incident on sea to generate high temperature over a large area.

18. Two Members were concerned about the heavy traffic in Ma Wan Channel as well as that along the coast of Tuen Mun Area 38 due to the clusters of heavy industries requiring marine access. Mr Amin Ebrahim explained that a very detailed marine traffic impact assessment had been conducted. They had worked very closely with the Marine Department and carried out simulations taking into account the busy traffic in Ma Wan Channel and other users in the district. Gazette notice was published and approval was granted under the Foreshore and Seabed Ordinance.

Action

19. In reply to a Member's enquiry about the marine traffic under extreme weather conditions such as typhoons, Mr Amin Ebrahim explained that the simulations included different types of wind situations and the issue was discussed at length with relevant authorities and the Port Operations Committee. The vessels would have to follow the rules laid down by the authorities when a tropical cyclone signal was issued.

20. A Member asked about the reason for not including the marine transport risk assessment in the revised EIA report. Dr Neil Ketchell explained that the requirement under the Study Brief was to conduct studies related to the tank farm, pipelines and jetty. Dr John Wrigley said that marine transport risk assessment in Ma Wan Channel had been conducted in previous studies, as stated in paragraph 10.3.1.3 of the EIA report.

21. Mr Amin Ebrahim said that they had briefed the Council in 1995 on the marine transit of aviation fuel to the existing temporary AFRF off Sha Chau and the risk identified was in the "As Low As Reasonably Practicable" (ALARP) region. The operation of PAFF would reduce the risk level considerably within the ALARP region. They had also briefed the Council in 2000 about the study results on the site selection which included the marine transport risk assessment in Ma Wan Channel.

Hazard assessment on tank farm

22. A Member enquired about the worst-case scenario (i.e. 100% instantaneous loss of fuel) under the QRA of the impact of an aviation fuel spillage. Dr Neil Ketchell explained that the risk assessment was mainly concerned with the people close to the facility, including those along the road outside the fence of the PAFF, in the SWS Mill and proposed EcoPark. The physical modelling under the worst-case scenario showed that oil flow would not affect the cement works, the Castle Peak Power Station or the nearest residential area.

23. The Chairman enquired about the details of the physical modelling. Dr Neil Ketchell explained that it involved the construction of scaled models to simulate impacts on the SWS. In conducting the physical modelling, the objective was to simulate the worst-case scenario. Tests were performed on instantaneous removal of the tank walls and unzipping one side of the tank in less than a second while the contents were still there. The results showed that the risks were well within the acceptable region of the risk guidelines.

Action

24. In response to a Member's suggestion of enhancing risk communication, Mr Amin Ebrahim said that they had been maintaining active dialogues with relevant parties and concerned groups. Leaflets explaining and clarifying the risk issue and concerns were to be distributed.

25. A Member considered that a precautionary approach should be adopted as the project involved life and risk. Dr Neil Ketchell explained that safety and precautionary measures had been adopted not just to meet or adhere to the standards or requirements but also to further minimize the acceptable risk level as far as practicable. The standard required for aviation fuel containment was a single bund wall and a site boundary fence outside the tank. However, the design of the PAFF included a partly sunken bund wall of 4.8 m high with wave wall, two separate impervious security walls and a landscape bund to contain spills. The containment system design well exceeded the international standards. The risk level outside this particular site was extremely low.

26. A Member suggested that an individual bund should be used for each tank rather than a collective bund for all the tanks. Dr Neil Ketchell explained that in the previous application made to the Fire Services Department (FSD) prior to the CFA's decision, the proposal of installing one collective bund for six tanks was considered acceptable by FSD.

27. Dr Shane Lo said that according to the international practice for oil installation, the maximum recommended storage capacity was 60,000 m^3 for a single compound and the bund wall height was 1.5 m. With mitigation measures, the recommended thresholds could be adjusted accordingly. Some of the oil storage facilities in Hong Kong exceeded this storage capacity. The key consideration was whether the fuel could be stored within a protected area away from ignition sources. Another important consideration was whether in the event of a fire, it could be dealt with efficiently and effectively.

28. In reply to a Member's enquiry about the tank farm design, Mr Amin Ebrahim confirmed that they adopted the best practices in the world in consultation with relevant government departments. For example, the fire fighting equipment would be the best compared with other similar tank farms world wide. The remote fire-fighting monitors to be used for the PAFF tank farm were more commonly found in situations such as liquefied gas jetties which involved much higher levels of risk.

29. Upon a Member's enquiry about the cumulative risk assessment, Dr Neil Ketchell confirmed that the total risk level of all events had been assessed having regard to risks associated with marine transport, jetty transfer, pipeline transfer, tank farm storage and instantaneous tank wall failure. The

total risk of all events was well within the acceptable level.

30. A Member said that he noted that the SWS claimed that the QRA should fall into the ALARP region rather than the acceptable region. Dr Neil Ketchell highlighted that the CFA required that the QRA must be both generic and project-specific. The QRA conducted by SWS's consultancy Health and Safety Laboratory (HSL) in 2003, which was based on one of the most pessimistic frequencies for the tank failure, was not applicable to PAFF. The frequency related to different types of fuels and tanks. They had reviewed the information available on previous incidents and concluded that the risk for a Jet A1 tank farm of PAFF in the Hong Kong condition was very low.

31. Dr Neil Ketchell said that they had not previously seen the new HSL report tabled at the meeting, but highlighted that the earlier HSL assessment assumed that the ignition probability of spills was 60%. However, this probability should be applicable to spills of fuel such as LPG but not spills of Jet A1. The report was based on conservative assumptions and well beyond the upper credible limit for assessment of the PAFF.

32. Dr John Wrigley said that the SWS adopted a set of assumptions very different from that of the project proponent. In any QRA, there would be a range of uncertainties. The sensitivity study was presented in Figure 10.13 of the EIA report.

33. In reply to the Chairman's enquiry about the experience learnt from the UK Buncefield incident, Dr Neil Ketchell explained that the incident involved overfilling of a petrol tank forming flammable gas clouds moving away from the tank. A large number of tanks were set on fire after the petrol vapour cloud explosion during the incident. Large amount of smoke was produced and the nearby major road was closed on two occasions as a precautionary measure. However, it was important to note that there was no fatality or serious injury either on-site or off-site. One lesson learnt from the incident was that the bund walls should be sealed with fire resistant material to prevent fuel and firewater seepage that could contaminate surrounding land. In the case of PAFF, fire-retardant joints would be used.

34. Upon a Member's enquiry about the Portland tank farm case in the UK, Dr Neil Ketchell said that he was unsure of the relevance, but undertook to review the information and provide further details on the case in relation to the PAFF.

(Post-meeting note: The project proponent provided supplementary information on the Portland tank farm case after the meeting which was

included in the relevant ACE paper.)

35. Dr Neil Ketchell drew Members' attention to the set of responses (tabled by the project proponent for Members' information) to the comments tabled by SWS at the meeting of the Tuen Mun District Council held on 13 March 2007. He highlighted the following –

(a) In response to the claim that the QRA had not addressed all hazardous scenarios – the EIA report had identified and considered all potential scenarios as stated in Table 10.2. In doing so, it had complied with the scope of the Study Brief which required consideration of the hazardous scenarios associated with the receiving, storage and export of Jet A1.

(b) In response to the claim that consideration had not been given to events such as an explosion of a furnace in the EcoPark or steel mill leading to an impact on the tank which would in turn had a knock on impact on the adjacent site – this scenario would not affect the quantification of the risks or contribute any further to the hazardous scenarios which had been assessed.

(c) In response to the claim that the PAFF would be the largest fuel depot in the world – fuel farms for aviation fuel and other fuels varied in size according to the requirements of the facility and the local circumstances. PAFF was not the largest fuel depot in the world. Even at Tsing Yi the storage capacity was about three times as great as the PAFF and two of the individual depots at Tsing Yi had capacities of about 95% of the PAFF and store a variety of fuels. The size of the PAFF was not therefore particularly unusual.

(d) In response to the claim about the high temperature areas and potential ignition sources inside SWS and EcoPark – the situation of hot-works in the steel mill coming in contact with Jet A1 was analyzed. It was concluded that it might be possible for the hot metal route to ignite a pool of Jet A1 below it. The consequences and frequency of an event being ignited in this area had been fully quantified within the assessment.

(e) In response to the claim that the siting of a fuel facility beside high temperature operation was extremely unusual in the world – the size of the PAFF, its layout and proximity to the flame, fire and high temperature were not particularly unusual and indeed

were quite common for other storage in refineries around the world. An example was the Shell Pernis refinery in the Netherlands where a large number of storage tanks for different types of fuel, including highly flammable fuel, was stored adjacent to furnaces. There were about 750 refineries in the world and this was the situation in most of them. One could also find storage tanks adjacent to residential development and ignition sources (such as power lines) as in the cases in Melbourne.

(The project proponent team left the meeting at this juncture.)

Internal Discussion Session

36. The Chairman suggested and Members agreed that –

(a) it was important to observe the CFA judgment in considering the revised EIA report; and

(b) the Subcommittee's recommendation had to take account of the Council's previous recommendations on the project and strong justifications would be required if deviation was deemed necessary.

37. On the issue of site selection and marine transit, Members noted that the project proponent had briefed and consulted the Council since 1996 on the site search and site selection process. Members agreed that the key issue was whether the situation in Ma Wan Channel had changed to the extent that it warranted a fresh assessment. Two Members were concerned about the consistency in adopting the ALARP principle in considering the marine transport risk for the current case and the LNG terminal project discussed by the Subcommittee at the previous meeting.

38. In reply to a Member's enquiry about the ALARP principle, Dr John Wrigley advised that under the risk guidelines, the area between the acceptable and unacceptable regions was borderline and called the ALARP region. It involved a conditional acceptance depending on the adoption of all practicable risk mitigation measures to reduce the risk as low as reasonably practicable. The project proponent had to adopt whatever practicable mitigation measures to avoid and reduce risk in the region. A project in the ALARP region could be deemed to meet the ALARP principle provided that the project proponent had demonstrated that they had implemented all practicable risk mitigation measures and such measures were implementable.

Action

A project in the ALARP region could be deemed unacceptable if no risk mitigation measure was implemented and the risk had not been mitigated to as low as reasonably practicable.

39. On the comparison of the PAFF and LNG cases, Mr Elvis Au said that aviation fuel vessels were currently using the Ma Wan Channel for marine transit to the AFRF and operation of the PAFF would reduce the existing risk. The vessel movements would be reduced from about 1,100 to about 200 per year. All practicable measures elaborated in Section 10.3.1.3 of the EIA report had been implemented in accordance with the ALARP principle. For the proposed LNG terminal project, it would involve adding new risk by large LNG carriers containing fuel with much greater hazard potential than aviation fuel. A cautious approach to LNG had to be adopted to avoid adding new risk in Ma Wan Channel. It had been confirmed by the relevant authority that the proposed mitigation measure (3 km marine exclusion zone around the LNG carrier) to reduce the risk level was considered not implementable in Hong Kong. The use of alternative route to South Soko would avoid adding new risk to Ma Wan Channel.

40. On the issue of hazard assessment on the tank farm, Mr Elvis Au advised that according to the CFA judgment, the QRA must be both generic and project-specific. Dr John Wrigley added that the assessment should involve two steps in searching all generic incidents occurred in the world and then filtering out irrelevant information to focus on project-specific information. As stated in paragraph 72 of the CFA judgment, the methodology required "searches for the relevant scenarios in the history of projects of the same genus – and thus identifies scenarios for the purposes of para. (i) [clause 3.3.10.1 of the Study Brief referred in paragraph 55 of the CFA judgment] – then quantifies risk by reference to that history and the specific features of the instant project…".

41. A Member said that the QRA presented by the project proponent and HSL used different assumptions and adopted different basis which led to differences in the QRA results. To facilitate Members' consideration, he suggested and Members agreed to request the project proponent to provide supplementary information on the assumptions used and basis adopted in the hazard assessment as compared with those used and adopted by other parties contained in the public comments on the EIA report. The project proponent should also provide responses to the public comments on the EIA report in the aspect of hazard assessment.

42. In reply to the Chairman's enquiry, Mr Elvis Au said that they had to forward the public comments received by the department during the public

inspection period to the project proponent under the EIA Ordinance. The project proponent would be able to get hold of all the public comments received by EPD for preparation of the supplementary information.

43. Upon the Chairman's enquiry, Members confirmed that they were satisfied with the assessment set out in the revised EIA report except that further consideration should be given to the outstanding issue of hazard assessment associated with the tank farm. The Subcommittee recommended that this outstanding issue be further discussed at the full Council meeting with further information to be provided by the project proponent.

Agenda Item 4: Monthly Updates of Applications under the Environmental Impact Assessment Ordinance

44. Members noted the updates.

Agenda Item 5: Any Other Business

Tentative items for discussion at the next meeting

45. The Chairman informed Members that the Secretariat would liaise with relevant parties and notify Members whether there would be submission of EIA reports which required the deliberation of the Subcommittee.

Agenda Item 6: Date of Next Meeting

46. The next meeting was scheduled for 23 April 2007.

(Post-meeting note: The meeting scheduled for 23 April 2007 was cancelled.)

EIA Subcommittee Secretariat
April 2007