

LEGISLATIVE COUNCIL PANEL ON HOME AFFAIRS

**Replacement of Planetarium Star Projector and Seating
at the Space Theatre, Hong Kong Space Museum**

PURPOSE

This paper briefs members on the proposal to replace the Planetarium Star Projector and seating at the Space Theatre of the Hong Kong Space Museum.

BACKGROUND

2. It is a mission of the Leisure and Cultural Services Department (LCSD) to enrich the community's life by providing quality leisure and cultural services. As a museum managed by LCSD, the Hong Kong Space Museum (the Museum)'s mandate is to promote astronomy and space science among the public.

3. The Museum attracts tourists in tens of thousand from overseas every year. The planetarium shows screened at the Museum's Space Theatre are popular among local and overseas visitors, attracting an average annual attendance of 137 829 in the past three years (2000 to 2002). Besides, the shows generated about 26% (\$8.8 million) of the Museum's total revenue (\$34 million) during the same period.

4. The Planetarium Star Projector (Star Projector) is used to project images of more than 8 000 stars onto a hemispherical dome screen, hence simulating the starry sky to a very high precision for astronomical education. It is a major attraction of the Museum and plays a crucial role in the planetarium shows. In fact, all world-class planetaria or space science centres are equipped with a high-quality Star Projector as a major facility of the institution.

CURRENT STATE OF THE PLANETARIUM STAR PROJECTOR AND THEATRE SEATS

5. The existing Star Projector has been serving the Museum for more than 22 years since the latter's opening in 1980. The aging of the projector, however, is seriously affecting its performance. The dimming controls of all the 32 fixed star iris motors report a high breakdown rate, two times per month on average. Spare parts are not available in the market, making repair impossible. The North and the South fixed star globes are not in perfect alignment with the constellation figures. The Cloud Projector has broken down and is unable to be repaired. The frequency of technical breakdowns is increasing and has led to cancellation of shows and ticket refund to the audience. The number of breakdowns and repairs recorded for the past three years are 22 (year 2000), 26 (year 2001) and 34 (year 2002) respectively. During 2001 and 2002, the number of shows cancelled due to breakdown of the Star Projector is two and four respectively. As the existing projector has become out-dated, some of the major spare parts¹ are no longer available in the market for replacement.

6. Same as the Star Projector, the theatre seats at the Space Theatre have been in use since 1980. The seats were subsequently equipped with stereo headphones and interactive button devices which allow the audience to select narration of shows up to four different languages and interact with stories and questions during programmes and various competition activities. The gently-sloped seating enables audience to sit back comfortably to view the projections on the ceiling screen of the theatre.

7. However, the physical conditions of the seats have deteriorated rapidly in recent years. Frequent repair and maintenance works are needed to tighten springs between the seat and the seat back and to replace broken hinges. Besides, the seats appear to be shabby and the aged padding foam fails to meet the present flame resistance requirements. In order to provide a safe and comfortable environment for the audience to enjoy the shows, it is necessary to replace all seats.

¹ Spare parts include fading star motor (opening/ closing motion of the iris and dimming control of all fixed stars), fixed star iris motor (controlling specific star field), constellation figures iris motor (controlling constellation figures), constellation controller card transformer (controlling half of the constellation figures iris motor), frequency convertor (controlling the azimuth motion of the Zeiss platform) and the hydraulic platform control switchboard (controlling the elevator on which the Zeiss platform resides).

8. Apart from seats, the performance of the stereo headphone system affixed to the theatre seats also needs improvement. The plug-in nature of the headphones has given rise to an unacceptably high breakdown rate.

PROPOSAL

9. We propose to replace the Star Projector and all the 316 seats, including the headphone system of the Space Theatre to maintain the quality of the planetarium shows.

Replacement Of The Planetarium Star Projector

10. Replacing the Star Projector with a new model would not only resolve the problems mentioned in paragraph 5 above, but also enable the Museum to screen planetarium shows of a higher quality. With the application of advanced digital technology, astronomical phenomena can be simulated through the projector on the hemispherical screen in a more precise manner. When post-production and editing procedures are done in digital format, operators of the projector will have a wider choice of special effects, making the shows more fascinating for viewing. It is expected that with these improvements, more people will be attracted to visit the Museum. With suitable maintenance, the new projector is expected to have a service length of 30 years.

Replacement Of Seating Of the Space Theatre

11. To solve the problems on seating of the Space Theatre mentioned in paragraphs 7 and 8 above, we propose to purchase new theatre seats with an interactive button device and a built-in headphone system. During the process of dismantling the existing theatre seats, the existing floor track lighting must be removed. It is also proposed to set up new floor track lighting compatible with the new seating plan of the theatre.

12. Upon completion of the replacement project, the Space Theatre will be equipped with theatre seats compatible with the up-dated safety requirements. The maintenance problems over the theatre seats and the interactive headphone system will be reduced, and the audience will find the new seats more comfortable.

FINANCIAL IMPLICATIONS

Non-recurrent expenditure

13. We estimate that the replacement project will require a total non-recurrent expenditure of \$34 million with breakdown as follows-

	Estimated cost \$' 000
(a) <u>Planetarium Star Projector</u>	
i. provision of the planetarium projector (including dismantling the old model, upgrading the hydraulic platform, installing and testing the new model)	26,000
ii. hoisting equipment, working platform, skilled technician and materials for installation period	1,500
iii. contingency	<u>1,500</u>
Sub-total :	29,000
(b) <u>Theatre seats</u>	
i. provision, delivery and installation of new seats	2,000
ii. embedding of interactive button system	1,500
iii. delivery and installation of built-in headphone system	1,000
iv. replacement of floor track lighting	<u>500</u>
Sub-total :	5,000
Total :	<u>34,000</u>

The above cost estimation is drawn up on the basis of market search on the various models and products used by major planetaria and space science centres in other countries.

14. The estimated cash flow requirement is set out below-

Year	Estimated cost \$' 000
2004-05	11,600
2005-06	18,600
2006-07	<u>3,800</u>
Total	<u>34,000</u>

Recurrent expenditure

15. No additional recurrent expenditure will be incurred by the proposed replacement of the Star Projector and seating of the Space Theatre.

16. As the Space Theatre will be closed for three months during the installation of the new Projector and seats, there will be loss of revenue on ticket income amounting to \$2.4 million.

IMPLEMENTATION PLAN

17. As there are no local suppliers for the Star Projector, and the dismantling/ installation work involved is rather complicated, it would take about 21 to 24 months to go through the tendering procedure, delivery and installation work. The Space Theatre would be closed for about three months during installation of the equipment, and the whole replacement project is expected to be completed around winter of year 2005².

² It would take about 9 to 12 months to go through the tendering procedure, and about 12 months for delivery of the equipment and installation work after placing order. Ideally, we expect the theatre to be closed from September, the low season of the Museum every year, for dismantling the existing facilities and installation of new ones within three months. The theatre is expected to be re-opened before Christmas.

ALTERNATIVES

18. We have explored other alternatives to solve the problems (paragraphs 5, 7 and 8), but no other feasible way-out can be identified. If the existing Star Projector is not replaced, the Museum may continue to use it until the projector substantially breaks down. However, the Museum would then not be able to hold any planetarium shows for more than a year pending procurement and installation of a new Star Projector. Worse still, the breakdown of the Star Projector might hamper the operation of the Omnimax film projector at the Space Theatre³. Should this be the case, the whole Space Theatre will have to be closed and the revenue loss is estimated to be about \$800,000 per month⁴. More importantly, both overseas tourists and local visitors will then not be able to enjoy a quality planetarium show, which is a major attraction in all world-class planetarium institutions. The Space Theatre in fact plays a crucial role in astronomical education for our students.

THE WAY FORWARD

19. We will seek the approval of the Finance Committee on 27 June 2003 for funding the above replacement project.

Home Affairs Bureau

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³ Currently, both projectors are in use in the Space Theatre. If there is malfunction of the Star Projector which cannot be lowered to its lowest position, it will physically block the projection of the latter and spoil the show.

⁴ The total revenue collected in the past three years (2000 to 2002) is \$28,891,997. The monthly average is therefore estimated to be \$802,555.