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About ISRS

The Indian Steam Railway Society is a non-profit organisation formed on 23rd October, 1999, by railway enthusiasts committed to the preservation of steam and other railway heritage.

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The Indian Steam Railways Magazine encourages readers to contribute to the magazine about issues related to preservation of steam and other railway heritage. Such contributions may include technical papers, humorous articles, information about forthcoming events, memoirs or photographs. All published contributions shall be suitably acknowledged. Please send your contributions to:

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Cover photo: NMR steam locomotive converted from coal-fired to oil-fired by Golden Rock Workshop of Southern Railway (Courtesy: Salem Division)

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MESSAGE

Within a month of my taking over charge as MM, one of the first events that I attended was the XII National Steam Congress conducted on the 8th of February this year by the Indian Steam Railway Society. I understood that this was an Annual event that the Society organised. I was, therefore, pleasantly surprised when I was informed of the XIII Congress in November. Of course, when it was explained to me that the month of February was not a good month owing to preparation for the Annual Budget of the Government of India at that time, it appeared logical that the date is being changed to November.

Be that as it may, being an ardent champion and backer of rail history and traditions in general and steam heritage in particular, it is my privilege to be the Patron of the Indian Steam Railway Society. We should not forget that for more than a 100 years, except for a small section around Mumbai (then Bombay) and an even smaller section around Chennai (then Madras), all rail traffic in India was carried by steam locomotives. There were more than 10,000 of these steam black beauties to be seen all over the country where there was a rail line, be it the hills or the plains, the forests or the deserts. We owe it to our children and grand children that we preserve this rich heritage so that they can also see and feel the charm of steam hauled trains that we went through in our childhood.

The Indian Steam Railway Society is at the forefront in this mission and responsibility of keeping steam locomotive from becoming extinct. I wish the Society and the coming National Congress all success in assisting and helping the Indian Railways to keep as many steam locomotives live as possible.
MESSAGE

ISRS extends a warm welcome to the Steam locomotive enthusiasts to the XIII National Steam Congress.

The theme of this year's Congress is the UNESCO World Heritage site, the Nilgiri Mountain Railway, where we have India's only Rack & Pinion Railway. A team from Southern Railway led by the DRM/Salem, Shri Shubranshu, will be giving a presentation on the Railway.

The Railway earlier had vintage Rack & Pinion Steam locomotives built by Schweizerische Lokomotiv-und Maschinenfabrik, Winterthur, Switzerland, now known as Stadler. Recently Golden Rock Workshop of Southern Railway has produced 4 Oil fired Steam locomotives which are in service. We will hear more about this from Shri Shubranshu and his team.

We welcome Mr. Alexander Karnes, our keynote speaker. It is for the first time we have a speaker from the USA. Alexander is also fond of making pencil sketches and our calendar this year will have his sketches of Indian Steam locomotives.

DHRS will be represented by Mr. David Mead. He has been visiting Tindharia Workshop lately and we will benefit from his observations.

We will also have the pleasure of hearing Shri K.Natrajan. He is a resident of the Nilgiris and not a railwayman. We look forward to his presentation.

I am sure you will all enjoy and benefit from the Congress.

(L.K.Sinha)

14, Poorvi Marg,
Vasant Vihar,
New Delhi-110057

Tel.: +91-11-26148844
1. The XII National Steam Congress was held at the National Rail Museum, New Delhi on the 8th of February 2015, under the auspices of the Indian Steam Railway Society (ISRS). The theme this year was the Darjeeling Himalayan Railway. Member (Mech), Indian Railway Board, Shri Hemant Kumar, was the Chief Guest.

1.1. The Congress this year perhaps had the best presentations ever.

1.2. The venue had a festive appearance on a bright sunny winter morning, where a photographic exhibition and stalls selling Steam Railway memorabilia were displayed.

2. The Congress was very ably compèred by the Organising Secretary, Vikas Arya, who welcomed all the participants.

3. Ashwani Lohani, Working President of ISRS, gave a brief introduction to the activities of the Society during the year and plans for the future. He also appealed for a Steam train to be run regularly on a time table which can be advertised so that tourists can plan their visits.

4. The President, Lalit Sinha, said that maintaining Steam Heritage can be a commercially viable activity as is evident from hundreds of Steam Railways running in the world and as will be brought out by the day’s presentations.

5. The Keynote speaker was Adrian Shooter from UK. Adrian is a steam enthusiast and the only person who owns a working Darjeeling Himalayan Railway locomotive outside India; This runs in his garden at Oxfordshire with two replicas of DHR coaches.

5.1. Adrian’s presentation was on the Tyseley Steam Depot and Workshop near Birmingham, of which he is a trustee. It was good to see the type of heavy repairs being carried out there, including welding patches on boiler. Adrian talked about exacting standards required for Steam locomotives to run on the Main Line at speeds of 100 mph+; something Tyseley specialises in. Mandatory modern safety signalling systems provided on the mainline locomotives presented a strange contrast to the vintage fittings.

5.2. It was also good to see how this shed has also become a major tourist attraction.

6. The theme presentation on the Darjeeling Himalayan Railway (DHR) was given by R.S.Virdi, General Manager, NF Railway. The series of landslides which led to major breaches to the Railway and interrupted through running during the last 4½ years were vividly shown by the pictures in his presentation. The good news was that the breaches had been restored and trial through runs are going on; the line should be formally opened in Feb. 2015.

6.1. In the statistics presented by him, it was interesting to note that 90% of the earning of the Railway was from Joy Rides. This goes to show how organised running of Heritage Steam trains can be a profitable venture.

7. Tarun Thakral spoke about the Heritage Transport Museum he has set up near Gurgaon. He has a remarkable collection of aircrafts, automobiles, railways and other modes of transport in his recently set up air conditioned, 3-storey museum.

8. Adesh Grover gave a presentation of the beautiful Model Railway in his farm, also near Gurgaon. The stations, signalling, landscaped track with tunnels and bridges and, of course, the rolling stock all looked so realistic.

9. Thereafter, there was a brief ceremony during which there was:

9.1. Presentation of Steam Award to the Delhi
9.2. Conferring of lifetime membership to Mrs. Nidhi Singh;

9.3. Book release, ‘Earth to Sky’ by Dr. Shivmohan and Dr. Sanjay Kaushal. This book covers the Kalka-Shimla Railway in pictures;

9.4. Release of ISRS calendar;


10. Chief Guest, Shri Hemant Kumar, in his address lauded the ISRS efforts to maintain the heritage of Steam Locomotives and spoke about his experience of the days when Steam ruled the Indian Railway.

11. It was a pity that Karen and Mike Maher of Lakeside and Haverthwaite Railway, UK could not be present for their presentation as they had left the previous day; the Congress had to be postponed by a day as elections in Delhi were announced for the original date of Feb. 7th, 2015. They, however, left an excellent video of their presentation, which was received very well with applause.

11.1. It was remarkable to hear how they have made this 3½ mile Railway a profitable venture by running steam trains, coupled with good marketing, add-ons like Station Restaurant, Gift Shop, visits to the Steam Depot and Specials for children. They arrange for group excursions for school children, picnics and birthday parties.

11.2. They have 8 steam locomotives, including a Thomas, the Tank Engine.

11.3. The key to profitability is their lean staff strength; 11 permanent staff which goes up to 40 during the peak season.

12. The Congress had representation from the State Railway of Thailand (SRT) for the first time. Ms. Kanrawee Thongpull represented SRT and gave an excellent presentation on preservation of Steam Heritage.

12.1. Steam locomotives were phased out in Thailand in early 1970s. Their revival resulted in the first Steam run from Bangkok to Ayudhaya on 23rd Oct. 1986, the Railway Day. Thonburi Depot is the nominated depot for maintaining steam locomotives.

12.2. The Railway has scheduled steam train runs from Bangkok to Ayudhaya, which are well advertised and, therefore, well attended. Again, their excellent marketing was evident. They have made one of the steam drivers a celebrity; he is a hero in Thailand and children line up to shake hands with him! Food fairs are held on the stations with the background of Steam Locomotives, Comics are available for children depicting engine staff as heroes and, of course, the Joy Rides.

13. Secretary ISRS, G Shanker, gave the vote of thanks. The main sponsors were Madhya Pradesh Tourism, Prag Industries and IRCTC. Of course, thanks were also due to scores of others who made the Congress such a success.

14. The Congress concluded with a round of the recently renovated National Rail Museum. A group photograph with the steaming Fairy Queen, the Guinness record holder for the oldest working steam locomotive in the world, was the highlight.
UNESCO’s Inscription

UNESCO inscribed NMR as a World Heritage Site in the 29th session of its Committee meeting, held in South Africa in July 2005, as a serial inscription to the Darjeeling Himalayan Railway (DHR), and branded both as “Mountain Railways of India” in accordance with the proposal of the Indian Railways. Indian Railways was represented there by me as Executive Director (Heritage) and by the Heritage Officer of Southern Railway. The evaluations had been completed by UNESCO in 2004. The newly established brand of “Mountain Railways of India” has been described by UNESCO as follows:

Still operational today, these hill railways crossing regions of great beauty, are outstanding examples of bold, ingenious engineering solutions for the problem of establishing an effective rail link through a rugged, mountainous terrain. The Darjeeling Himalayan Railway opened in 1881, while the NMR, though proposed in 1854, was begun in 1891 and completed in 1908 due to the difficulty of the mountainous location, which scales an elevation from 326m to 2203m. It was highly significant in facilitating population movement and the social-economic development in the British colonial era.

The NMR has unusually high cultural values, reflecting successive population movement into the Nilgiri Mountains, after the British began to use the area as a resort. The NMR transformed the Nilgiris from a remote area inhabited by tribal people into an important region. It brought the Nilgiri district into the mainstream and monetised the traditional barter economy. The Toda people, one of the five main tribal groups, celebrated the coming of the railway in at least two songs dating from the early 20th century. The district is now fully integrated in the mainstream of Indian social, cultural and political life.

The NMR is still operational and easily the most authentic and original rack and adhesion railway in the world. It remains much as it was at the time of its completion in September 1908: stations, signals, 

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<tbody>
<tr>
<td>1</td>
<td>Darjeeling Himalayan Railway-1879</td>
<td>West Bengal, Darjeeling &amp; Jalpaiguri Districts, from New Jalpaiguri to Darjeeling</td>
<td>26°40′48″N &amp; 27°01′48″E and 88°27′36″E &amp; 88°15′36″E</td>
<td>5.34 ha</td>
<td>70 ha</td>
<td>Linear Property 87.48 Kms long &amp; 0.61m wide; Buffer zone 3m on hillside &amp; 5m on valleyside.</td>
</tr>
<tr>
<td>2</td>
<td>Nilgiri Mountain Railway-1899</td>
<td>Tamil Nadu, Nilgiri &amp; Coimbatore Districts from Mettupalayam to Ooty</td>
<td>11°30′37″N &amp; 11°17′54″N and 76°56′09″E &amp; 76°17′55″E</td>
<td>4.59 ha</td>
<td>500 ha</td>
<td>Linear Property 45.88 Kms long and 1m wide; Buffer zone along the line of varying width.</td>
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<td>3</td>
<td>Kalka Shimla Railway-1903</td>
<td>Himachal Pradesh (Shimla &amp; Solan districts) &amp; Haryana(Panchkula District)</td>
<td>30°51′08″N &amp; 31°06′17″N, and 76°56′15″E &amp; 77°10′3″E</td>
<td>79.06 ha</td>
<td>74.88 ha</td>
<td>Linear property 96.60 kms long and 0.76 m wide; Buffer zone along its length of varying width.</td>
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Matheran Light Railway has also been proposed & Kangra Valley Railway is due to be proposed.
rural environment, locomotives and rolling stock; all are much as they were in the first decade after its completion. Such railways are rare. This is the only such intact railway in the Asia-Pacific region.

UNESCO’s decision was formally conveyed on 25.07.2005 (29 COM 8B.31) as follows:

The World Heritage Committee,

a) Having examined documents WHC-05/29COM/8B, WHC-05/29.COM/8B.Add and WHC-05/29.COM/INF.8B.1

b) Approves extension of the Darjeeling Himalayan Railway (India) to include Nilgiri Mountain Railway, on the basis of the cultural criteria (ii) and (iv) and renames the extended property as Mountain Railways of India;

Criterion (ii): The mountain railways of India are outstanding examples of the interchange of values on development in technology, and impact of innovative transport system on the social and economic development of a multicultural region, which was to serve as a model for similar development in many parts of the world.

Criterion (iv): The development of railways in the 19th century had a profound influence on social and economic developments in many parts of the world. The Mountain Railways of India are outstanding examples of a technological ensemble, representing different phases of the development in high mountain areas.

History

Protected by wild escarpments and at an elevation of about 2000m, the Nilgiri or Blue Mountains are located at the tri-junction of the Indian states of Tamil Nadu, Kerala and Karnataka. Nilgiri is derived from two Sanskrit words “Nilam” and “Giri” that mean “Blue” and “Hill” respectively. This is apparent when the hills are viewed from a distance enveloped in a blue haze that usually shrouds them.

Nilgiris were isolated until the 19th century. The Todas believe that they have always lived on the Nilgiris since time immemorial. Legend has it that ‘God dropped a pearl on a mand and out of this pearl came their God, Thakkirsi, who beat the earth with a cane to create rising dust and from whence came the first Toda. Ootacamund is a corruption of the word Utaka-Mand, meaning a mand or a collection of quaint huts of the original Todas.

British settlement of the hills began in 1820. By 1830, there was a military commandant there and British families from Madras had begun building summer houses, especially at Ootacamund. By 1870, the Madras Government as a whole was moving there for the summer, in imitation of the annual migration of the Viceroy’s Government from Calcutta to Simla.

The history of NMR dates back to 1854, when proposals were first mooted by the British to build a railway up the hills from Mettupalaiyam. Work began on the Madras-Coimbatore line in 1853, the line finally opening in 1862. The branch to Mettupaliyam opened in 1873. The problem then was how to replace the tedious ascent by bullock-cart or pony to Coonoor. The then District Engineer of the Nilgiris, J.L.L. Morant, just a year after the line opened to Mettupaliyam, proposed a rack railway to conquer the escarpment, similar to the Lisbon Steam Tramways. He was aware of the then new Mt. Washington and Rigi Rack Railways and could see the potential of applying this technology to the ascent of the Nilgiris. Niklaus Riggenbach, the inventor of the rack system named after him, which was used on the Rigi Railway in Switzerland, offered to build a railway in 1876, but on such terms that the Madras Government declined the offer. He visited India in 1882, submitted another proposal which found acceptance, and the Nilgiri Rigi Railway Company Ltd. was formed. However, the insistence on a 4% Government guarantee by him and his partner, Morant, stymied the scheme.

Improving technology appeared to offer better prospects by the mid-1880s. In 1885, the Nilgiri Company was formed with a capital of 2.5 million to
undertake the construction of the Mettupalaiyam-Coonoor railway line. The first rack and adhesion railway in the world was opened from Blankenburg to Tanne in the Harz Mountains of Germany in 1886. Its rack system, designed by Roman Abt, was superior to the earlier Riggenbach system. Sir Guildford Molesworth, the former Engineer in Chief of the Ceylon Government Railway and a talented builder of mountain railways there, visited the Harz in 1886. In his role as the consulting engineer to the Government of India, he advised a rack and adhesion line on the Abt system for the Nilgiris. Lord Wenlock, the then Governor of Madras Presidency, inaugurated work on this line in August 1891 but the company’s capital was exhausted in 3 years. A new company was formed in 1896 and completed the line to Coonoor two years later. The line was opened by the Governor of Madras on August 11, 1898. The line had already changed hands thrice, each time a new company being formed owing to the liquidation of the earlier one. A shortage of capital delayed the opening for the best part of a year and the company was unable to contemplate further construction on to Ootacamund (now Udagamandalam). It was relieved to be able to sell its assets to the Government in 1903. Thus, the railway was completed by the Government only by 1908. It was worked as a concession of the Broad Gauge Railways on the plains, initially by the Madras Railway Company till 1908, and thereafter by the South Indian Railway. Direct government control resumed in 1944. In 1951, the NMR was incorporated into the new Southern Railway zone of the Indian Railways and has been part of this zone ever since.

Thus, the building of these 46 kms. took no less than 32 years from the time of Riggenbach’s first concrete proposal until the railway’s completion. The difficulties of terrain were extreme and the technology experimental. It was only the success of the Abt’s Railway in the Harz which made NMR possible. The history of NMR’s construction illustrates both, the railway’s outstanding qualities in terms of its achievement, and its significance as an example of technology transfer from Central Europe into Southern India.

**Description of NMR**

NMR is a meter gauge, single track railway, about 46 kms. long, from Mettupalaiyam to Udagamandalam, with about 250 bridges (32 major) and 16 tunnels. It is located in the state of Tamil Nadu, India. Mettupalaiyam is the terminus of the Broad Gauge branch line from the large city of Coimbatore. Trains run through to Mettupalaiyam from Chennai, including the overnight Nilgiri Express with its connection to the Meter Gauge service to Udagamandalam. Mettupalaiyam is at an elevation of 326m, while Udagamandalam is at an elevation of 2203.

NMR can be divided into three sections as follows:

i) Mettupalaiyam to Kallar (405m), about 7 kms. is in the plains, running through beetel-nut palm and other plantations. This is in Coimbatore district whereas the rest of NMR is in Nilgiri district. Maximum speed is 30 kmph. Mettupalaiyam was a small village in the 1850s. It gained importance only after the British laid a Broad Gauge line in 1873. Mettupalaiyam now has the carriage and wagon depot of NMR.

ii) Kallar to just short of Coonoor (1712m) is the rack section which climbs 1330m in 19 kms. The average grade is 1 in 15 and the steepest is 1 in 12. There are 208 curves (sharpest 17½°) and 13 tunnels. There are 27 viaducts, most of composite steel and stone construction, featuring spans of 60 feet (NMR was constructed to imperial measurements, although its track was meter gauge), supported by stone abutments and piers. The Kallar Bridge over the River Bhawani, the Adderley viaduct and the Burliar Bridge are notable examples of such composite bridges. Here the railway climbs through almost uninhabited jungle. So steep are the hillsides that commercial exploitation of the forests has never occurred and agriculture is impossible.

Heavy rainfall and the rich soil means that these
jungles are luxuriant and tropical. The last five kilometres feature fine views over the escarpment, which the train has just ascended and the country opens up as tea estates start to line the railway. Maximum speed is 13 kmph. Coonoor is built on one of the best geographical locations in the Nilgiri Mountains. Surrounded by hills, Coonoor possesses a cool and equitable climate. After being a terminus for the NMR for 9 years, Coonoor still remains as one of the best stations on the line. The gabled structure of Coonoor station has been retained.

iii) The third section, 18 kms. long, is a contrast to what precedes it. The landscape is neat, manicured and the dominant eucalyptus and acacia forest suggests to a passenger a journey in South Eastern Australia rather than Southern India. Now, only by adhesion, NMR continues to climb the Nilgiris, till it reaches its summit just before the terminus at Udagamandalam at 2203m. The ruling grade on this section of 1 in 23 is still very steep. There are also three tunnels including the longest on the line (282m). Maximum speed is 30 kmph. Udagamandalam, being the highest point of the line, is a much sought after tourist destination.

Rack rails are toothed steel bars, in a double row, so that the tooth of one rail is directly opposite to the gap of the other, to ensure that the engine pinions do not work off the racks while negotiating curves. The entry to the rack is made through tongues laid in special channel sleepers fitted with bow springs and connecting links connected finally to the rigid bars.

Due to the steep gradient, the following two different braking systems are used:

i) Adhesion braking between the wheel and the rail through friction, by vacuum and brake gear;

ii) Brake application through the locomotive pinions that are made to drive the pistons, causing dynamic braking. Clasp brakes, actuated by hand wheels on the brake drum and mounted on the pinions can also be used to apply braking on the cog wheel.

The coaches and wagons are all provided with brakesmen who independently operate friction brakes and rack brakes based on whistle codes from the driver.

NMR’s stations are well maintained and are all original, except Udagamandalam that was extended in the 1980s and its locomotive depot demolished soon after. All the original structures are still in use. Maintenance standards on the NMR are high, as the railway is used fairly intensively (five passenger trains are scheduled each day, including a tourist special) as much as it was designed to be used. The signalling system is original.

The locomotives and rolling stock are of heritage value though they are not from the date of the opening of the railway. The steam locomotives which work all traffic on the rack section are the X class designed in 1911 and built by the Swiss Locomotive and Machine Works (SLM) in Winterthur between 1913 and 1952. YDM4 class diesel locos work the train on the adhesion sections. (New steam locos have now been built by the Golden Rock workshop of the Southern Railway and some locos converted from coal firing to oil firing - Editor). The carriages date from the inter-war period. Modern passenger cars are operated to meet the needs of today’s clientele but there is a lot of old equipment on the line for it to have much the same ambience as it did in the 1920s. The Indian Railways lays great emphasis on the preservation of the NMR including the line, rolling stock and all associated buildings in their original shape to the extent possible. The countryside served by the railway also retains its charm over time. The natives look upon the railway as a friendly symbol of the mountains rather than as a harbinger of change. Overall, the NMR is authentic, well preserved and plays an important economic/social role for its
neighbourhood. Trains on the NMR offer a rich and scenic expanse of the entire Nilgiri Mountain area, chugging always with the locomotives at the lower (Mettupalaiyam) end.

**Cultural significance**

This Railway is a living example of the engineering enterprise of the 19th century. Its construction provided an access to this hill station and also proved to be a boon for the tea growing industry. This line provides one of the most panoramic views to its travelers. Use of innovative measures like rack & pinion to follow an incline steeper than that permissible by normal adhesion is another very significant feature of this line. It is also noteworthy that this line besides being a tourist attraction is also a regular mode of transport for the local population. The NMR retains its original features of 1899 when the first section was opened till Coonoor.

Few Railways have led to the creation of such works, which reflect its cultural significance. This significance is highly representative, and it is also unusually striking and well documented. As such, the NMR has claims to universal significance on cultural grounds. The railway was a product of the colonial era, and it was built primarily to serve the colonial masters – their tea gardens, their summer capital, their cordite factory – but Indians, both the tribal people who had been there for centuries and the numerous migrants who came with the British from the plains, have made it their own, culturally as much as economically.

Thus, the cultural significance of the Nilgiri Mountain Railway extends beyond its significance as a built structure in a landscape, although it is notable in this regard alone. The landscape through which it passes is beautiful but challenging, and the technical solutions the railway’s builders used to meet the challenges are a testimony to their creativity and ingenuity. But the NMR is also a railway, which had a crucial role in causing changes in population, economic patterns and culture. It is a tangible expression of those changes, which it occasioned.

Considering interchange of human values (UNESCO’s cultural criteria C(ii)), the NMR has dual significance.

i) First, it is an example of a colonial railway. Part of that process was technology transfer (NMR is a spectacular example although not a unique one) and European patterns of organization. The area across which the NMR runs was transformed by human intervention including tea-growing between Coonoor and Udagamandalam. The dominant tree cover on the Nilgiris is eucalyptus, imported from Australia by the British, while the dominant commercial crop is tea, similarly imported from China. This Railway also bears a unique testimony to the cultural tradition of tea plantation, which still remains a source of livelihood of the populace of that region. Thus, the landscape has been given unique qualities as a result of Railway construction. Socially, the Nilgiris have been a location for interaction British and South Indian communities. The social effects of this interaction remain prominent to this day.

ii) The second way in which technological and social interchange is evident is through the application of rack technology of the west, to establish a rail link in the east. Switzerland never had colonies and most applications of Swiss rack Railway technology outside Europe were the work of the British or Dutch. The Swiss steam locomotives still work all traffic on the rack section and the tourist special on the adhesion section. This export of technology has contributed to the unusual if not quite unique features of the NMR.

As an outstanding example of a technological ensemble illustrating a significant stage in human history, (UNESCO’s cultural criteria C(iv)), this Railway is a unique example of construction genius employed by Railway engineers in the latter part of 19th century. When the Railway was being built, people went up the hills on horseback and on foot which took them more than 10 days to reach Udagamandalam, braving insects and wild animals. With the introduction of the Railway, the 45 km. journey took only 4½ hours. The manner in which height is gained in this Railway
by rack and pinion mechanism is amazing. The NMR became a part of the life of the local population and has remained as such. Various facets of the Railway line, viz. the rack & pinion mechanism to gain height, the steam engines, coaches, the station buildings preserved in their original shape, all bear testimony to the technological skills of the bygone era are an outstanding demonstration of their function and illustrate a significant stage in human history. While the NMR is not quite unique as an example of the transfer of Railway technology to remote locations outside Europe, it is certainly the outstanding remaining example in the world, in terms of its scale, authenticity, continuity and presentation; a development of the 19th century that is preserved over time. Thus, it is clearly and spectacularly illustrative of a significant stage in human history. Today, the NMR stands out as a heritage symbol of the region. As an ensemble, with its impeccably maintained permanent way; its elegant, original stations and associated buildings, and its large proportion of old rolling stock and locomotives, it is genuinely outstanding, even unique.

**Comparative Analysis**

Railways came to India in the 1850’s. Hill Railways began with the construction of the DHR in 1889. The NMR, opened next in 1899. The Kalka-Shimla Railway, Matheran Light Railway and Kangara Valley Railway, followed thereafter. These Railways are all living examples of the engineering enterprise of the 19th century. Their construction provided an access to the area and its hill stations. This also proved to be a boon for the local population. They provide panoramic views to travelers. They use innovative measures to overcome the challenges of the terrain in distinctive ways. The DHR used Zig-Zags & Spirals. The NMR used rack & pinion to follow an incline steeper than that permissible by normal adhesion. The Matheran Light Railway used curves that are incredibly sharp and unique floating axles on the locomotives to go around the hillside. The Kalka-Shimla Railway and Kangara Valley Railway use very heavy engineering at a very early stage of Railway development. These are all outstanding examples of the earliest Hill Passenger Railways that are fully operational with most of their original features intact, as tourist attractions as well as a regular mode of transport for the local population. Following the inscription of the DHR, the NMR has now been inscribed as a World Heritage Site and the other Mountain Railways can also be proposed. (*Today, the Kalka-Shimla Railway is also a UNESCO World Heritage Site - Editor*)

The NMR is both a rack and an adhesion Railway i.e. mixed technology. It combines traction through pinions (to prevent slipping) where the gradient is too steep and adhesion as in conventional railways. Rack Railways were built to enable Railways to penetrate extremely inhospitable and steep terrain (steeper than about 1 in 20), which would not be accessible to conventional adhesion Railways. Most rack and adhesion Railways were built in last decade of the 19th and the first half of the 20th century, and the NMR is no exception. By the time rack and adhesion technology was mature, the motor age led to roads becoming the normal means of access to such locations. With very few exceptions, rack and adhesion Railways have been built to a gauge of either one meter or 3’6”. The European, South American and Vietnamese lines were built to the former gauge, the African, Indonesian, Japanese, Australian and New Zealand lines to the latter. The NMR is a meter-gauge Railway. There are also a couple of modern rack and adhesion Railways in the Asia-Pacific region, notably in Japan (the Oigawa-Ikawa line) and Australia (the standard-gauge Skitube, just 10 years old), but they have no heritage value.

The first rack Railways for tourist purposes date from the late 1860s and early 1870s (Mt Washington, USA and Rigi, Switzerland). Most rack and pinion lines use conventional flat floor (as opposed to stepped-floor) carriages and keep their maximum grade to around 1 in 8, so passengers don’t slide off their seats. Rack Railways exist in various parts of the world, mostly in Europe. These are, for the most part, tourist
Railways, whose aim is to take tourists to a mountain peak. Most examples of such Railways are in Switzerland, where there are about sixteen of them, the longest a little over ten Kilometers in length. Rack sections are a relatively small proportion of the total route, and, compared with the NMR elevations gained, are also relatively modest. Applications of this technology outside Switzerland are rare. There are similar Railways in Austria and Hungary. A remaining example in Asia and the only real rival to the NMR is the nine Kilometers of Railway between Ambarawa and Bedono, the last surviving fragment of the 3'6" gauge line between Semarang and Yogyakarta in Java. Climbing by rack to an elevation of 711 m at Bedono, this line is maintained in original condition and with original locomotives for heritage and tourism purposes by the Indonesian Railway administration. However, although what remains is very authentic, it is only a fragment of original route and it is no longer a commercially operating Railway.

There were other examples of rack and adhesion Railways in South America, Africa, Australia and New Zealand, but they have been closed, while elsewhere in Asia, the Da Lat line in Vietnam has been closed, the Usui-Toge section of the Japanese transalpine line bypassed by a tunnel, and the Bukittinggi line in Sumatra has been both degraded and partially modernized. The finest example in some ways was the Transandino Railway, linking Chile and Argentina. This retained some of its steam locomotives for emergency use until its closure and regrettably it no longer exists to be nominated for World Heritage Status. In just 36.5 km. between Rio Blanco (Chile) and Las Cuevas (Argentina) this line climbed 1730 m (5676 feet) to a summit of about 3200 m (10500 feet) in the Uspallata Tunnel (itself over three kilometers long) that was bored beneath the frontier. NMR is easily the finest rack and adhesion Railway and the most original example of the phenomenon in the world.

To compare the NMR as a technical feat with other rack Railways, it is probably best to examine the altitude gained over the length of the line. In the case of the NMR the rack section of the line from Kallar to Coonoor climbs a total of 1330m in 19 km. Since the closure of the Chilean Transandino and the opening of the new Furka tunnel on the Swiss Furko-Oberalp line, the NMR’s ascent by rack is easily the greatest of any surviving rack and adhesion line. Over its entire length of 46 km, the NMR climbs 1877m by a mixture of rack and adhesion. This exceeds by a considerable margin the ascents on both the old Furka-Oberlap and the closed Transandino lines. Also, the steepest sections of the NMR continue to be worked by steam locomotives of a class introduced a few years after the Railway opened. By world standards then, and by any criterion, the NMR is an outstanding rack and adhesion Railway.

The Way Forward
Conservation of NMR should broadly covers the following:-

i) Conservation of NMR’s Cultural / Natural Heritage;

ii) Improving the surroundings / environment;

iii) Sustainability.

This, to a great extent, can be met by action as follows:-

i) A separate management structure in the NMR with an independent Director /NMR as in-charge like in the DHR;

ii) An institutional framework for enabling intervention, coordination and facilitation;

iii) A Multidisciplinary Conservation Management Plan;

iv) Ground work for specific interventions in terms of conservation, management, environment, tourism, community-development and sustainability.

Selected references for this purpose are as follows: -


• UNESCO (1999), GIS and Cultural Resource Management
  – A Manual for Heritage Managers
• World Conservation Union (IUCN) and World Commission on Protected Areas (WCPA). http://www.iucn.org/themes/wcpa/index.html
• National Rail Museum (2004), DHR’s International Stakeholder Workshop Report

Selected Laws / Guidelines relevant for NMR are as follows: -
• The Railways Act, 1989
• Public Premises (Eviction of Unauthorised Occupants) Act, 1971
• The Ancient Monuments & Archaeological Sites & Remains Act, 1958
• The Antiquities & Art Treasures Act, 1972
• Environment (Protection) Act, 1986;
• Forest (Conservation) Act, 1980;
• Water (Prevention & Control of Pollution) Act, 1974;
• Air (Prevention & Control of Pollution) Act, 1981;
• Wild Life (Protection) Amendment Act, 2002;
• Biological Diversity Act, 2002;
• Guidelines of Indian Mountaineering Federation, Mountain protection, International Mountain Day and International Partnership for Sustainable Development;
• Bio-Medical Waste (Management & Handling) Rules 1998;
• Hazardous Wastes (Management & Handling) Amendment Rules, 2002;
• UNESCO’s Convention on the Means of Prohibiting the Illicit Import, Export and Transfer of Ownership of Cultural Property, 1970 and as ratified from time to time;
• ICOM’s Code of Ethics, 1986

Selected links for best practice are as follows: -
• Asia Pacific Heritage Rail & Tourist Organisation (APHTRO), http://www.aph tro.org
• The Rheilffornd Ffestiniog Railway UK http://festrail.co.uk ;
• The Indian Steam Railway Society http://www.indiansteamrailwaysociety.org ;
• The Semmering Railway Austria http://www.semmering.at ;
• Heritage Railway Association (HRA) UK http://ukhrail.uel.ac.uk ;
• Europäische Föderation der Museums- und Touristikbahnen (FEDECRAIL) http://www.fedecrail.org

Assessment by APHTRO
In March 2014, APHTRO President accompanied me & Dir/DHR in a visit to NMR. After substantive review of the entire section & its steam shed as well as discussions with CME, DRM & Stakeholders; the following was proposed to General Manager, SR:-

• More Trains (optimize use of available Rolling Stock:-

<table>
<thead>
<tr>
<th>S.NO</th>
<th>Section</th>
<th>Coach</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MTP-UAMMTP</td>
<td>3 X 1</td>
<td>Existing Nilgiri Exp with steam to UAM (Lioever steam loco as UAM)</td>
</tr>
<tr>
<td>2</td>
<td>MTP-ONRMTP</td>
<td>3 X 1</td>
<td>Extra three pairs (mor, aft &amp; eve) rake link combined with above.</td>
</tr>
<tr>
<td>3</td>
<td>ONR-UAMONR</td>
<td>5 X 2</td>
<td>3½ pairs of service by each rake/day = 7 pairs every 90 minutes</td>
</tr>
<tr>
<td>4</td>
<td>Spare/Charter/FTR</td>
<td>4 + 3</td>
<td>Charter rates to be reviewed</td>
</tr>
<tr>
<td>5</td>
<td>Inspection Carriage</td>
<td>1</td>
<td>May be allowed as 4th coach with Steam or 6th/7th coach with Diesel</td>
</tr>
<tr>
<td>6</td>
<td>POH</td>
<td>5</td>
<td>Arising is only 1 coach a month</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>29</td>
<td>Plus Joy-train in UAM yard in open wagon with Lioever steam above</td>
</tr>
</tbody>
</table>
• Appropriate Conservation & Development of Stations:-
• Building: Tiles, Gable, Barge Boards, Ridge, Facade, Doors, Windows, Pillars, Balustrade, Bell, Furniture, Archives, Pictures;
• Platform: Floor, Fence, Benches, WaterColumn, Lamps, Bins, Toilets, Signage, Snacks/Drinks/Book/Gift/Help etc.
• Misc: Plants, Trees, Waterways, Signage, Artefacts, Photoops from all sides, Posters, Murals, Character etc.
• Heritage Steam Shed including C&W & Visitor walkway.
• Re-location of C&W shed at MTP to ONR in the oil siding in order to aggregate NMR’s supervision & cadre/services management (75% services are in ONR-UAM).
• Road entry extension by dismantling a bay in oil siding with visitor walkway in valley-side.
• Expansion with 2 lines by side of shed and new FOB skyway on MTP side to platforms, cabin & path to visitor walkway.
• Special RRB recruitment for willing to work with HQ at ONR.

With Best Compliments:

SHAHI MD. KARIM

CONTRACTOR N. F. Railway
GOALPARA

Phone: No.:99647-09594 (M)
03663-246074 (O)
Asked to name their favourite steam heritage railway, most UK enthusiasts – regardless of any special loyalties – would readily admit that these two are amongst the very best standard gauge lines.

So when Vikas Arya (of the Indian Steam Railway Society) came to the UK earlier this year (2015) to represent the ISRS at our DHRS AGM it was no hardship at all for me to accompany him and to show him what makes these two railways so very special.

The Bluebell Railway

Opened in 1882 by the London, Brighton and South Coast Railway this was part of a long cross-country line in Southern England that ran from East Grinstead to Lewes. In the 1920s, increasing competition from road lorries took away much of the staple goods traffic and the line was closed by British Railways in 1958 – some years before the extensive ‘Beeching Report’ cutbacks of the 1960s. Using privately raised funds, the first stretch of track was re-opened in 1961, becoming the World’s very first railway to run a regular passenger service with unpaid volunteer staff.

Over the next half century the Bluebell has made huge progress, re-opening the line slowly northwards to a mainline connection with the national network at East Grinstead and developing extensive facilities for the repair and overhaul of its large fleet of vintage locomotives, carriages and wagons. Along the 11 mile track each station is carefully themed to a specific period in the line’s history; this authenticity makes it a prime location for filming purposes (such as the hugely popular ‘Downton Abbey’ series) bringing in much useful revenue and widespread publicity. The recent re-connection with the national network is also proving a big success – excursion trains can now visit the railway from anywhere in the UK. The Pullman dining car train is a great venue for any special occasion. Whilst at Sheffield Park, an excellent museum covers all aspects of the railway’s history.

The web site is at www.bluebell-railway.co.uk

Q Class 0-6-0 No 30541 b.1939 leaves West Hoathly tunnel and heads north towards East Grinstead. It was on this locomotive that Vikas Arya enjoyed a footplate ride

The well-equipped carriage and wagon workshop at Horsted Keynes has a high reputation for restoring old Victorian-age wooden bodied carriages. A viewing gallery enable visitors to see the volunteers at work.
Severn Valley Railway

For much of its sixteen miles the railway runs parallel with the meandering river from which it takes its name; a highlight of the trip is the crossing of the river on the Victoria Bridge – a massive 200 ft. single span high above the water. As there are few roads in the valley, some of the views are only visible from the train; the scenery is varied and unspoilt with immaculately maintained stations giving access to local villages and riverside walks.

Running between the West Midlands towns of Bridgnorth and Kidderminster, where there is a main line connection, the line opened fully in 1878 and gradually closed by 1970. Its preservation dates from 1965 and five years later an initial five mile stretch of track was re-opened. Steady progress followed and the
The main locomotive depot at Bridgnorth, northern terminus of the line. In the right far background is the boiler workshop.

final section into a brand new station at Kidderminster Town was re-opened in 1984. Over sixty full time staff are supported by several hundred active volunteers.

On a typical day the railway has eight steam locomotives available for traffic, whilst an operational fleet of over sixty carriages has impressive covered accommodation complete with a mechanical washing plant. There is also an extensive fleet of wagons both for maintenance use and for photographic charters, enabling authentic photography and filming of period-perfect goods trains. At Bridgnorth, the main locomotive depot, there is also a well-equipped boiler workshop that does work on a contract basis for other heritage railways as well. Almost any job can be tackled.

There is just one connection with India. The line runs past the West Midlands Safari Park; so from the train you can spot elephants and tigers!

The web site is at www.svr.co.uk

About the author:

The author, Paul Whittle, is Vice Chairman of The Darjeeling Himalayan Railway Society in the UK.

Diesel electric 08 Class No D3586 on shed at Bridgnorth. This was the standard general purpose diesel shunter. With an 850 HP engine no less than 996 were built by British Railways between 1952 and 1962. The number of heritage diesels of all types on UK heritage railways is almost 700, most in working order and all with their own enthusiast supporters.

Interior of the special carriage built during World War 2 in 1941 by the London Midland and Scottish Railway for His Majesty King George IV. For protection against enemy air action the carriage was armour-plated and had removable steel shutters over the windows. The carriage was used by the King for his wartime travels across the UK for important military meetings and morale-boosting visits. There was a second similar carriage for the use of Her Majesty Queen Elizabeth.

Exterior of the Royal carriage. Part of the impressive 'Engine House' at Highley where locomotives awaiting overhaul are put on display.
The earliest steam locomotives, like Stephenson’s Rocket, had a single pair of driving wheels. When trailing loads became heavier, it became necessary for the locomotive to obtain a better “grip” on the rails. Accordingly, the use of a single pair of driving wheels was soon superseded by additional wheels coupled together. This gave the desired result.

In front, smaller leading wheels more easily took the curves, and then, to help bear longer engine frames, rear wheels were added under the firebox and driver’s cab. The extra axles also took some weight off the driving wheels.

Locomotives were required for different trailing loads, different speeds, different terrain characteristics etc. Wheel arrangements were designed to suit these requirements and a variety of different combinations of wheels were developed. Built for a US Railroad in 1832 the locomotive “Experiment” was given a pivoted “Bogey” in front to take curves even better. By and large, freight locomotives needed more driving wheels but fewer leading wheels; fast passenger locomotives needed a bogey for its leading or pony wheels and larger but fewer driving wheels. Small shunters moving less hurriedly often needed neither leading nor trailing wheels.

Steam locomotives having the same combination of wheels got classified together. Some acquired names which survived, based upon some characteristic, such as place of manufacture, home-shed, jurisdiction etc. For example, early freight locomotives with a pair of leading wheels, four coupled driving wheels and a pair of bogey trailing wheels were locally called “Berkshires” after this locomotive type hauled freight trains over the Berkshire Hills in North East USA better than the earlier available locomotives so engaged. This combination of wheels was first depicted as o-O-O-o (with a line across the driving wheels to show they are joined together).

In 1900, Frederick Methvan Whyte, a mechanical engineer of Dutch background who worked for the New York Central Railway, devised a way of describing wheel arrangements. This system, which has come to be known as the “Whyte Notation”, counts the number of wheels from left to right and separates the leading (or pony or pilot) wheels, the driving and the trailing (or rear) wheels by dashes. The Berkshire class (one such shown on this page but facing right) would get written 2-8-4, indicating that the locomotive has a pair of leading wheels in front, eight driving wheels (four on each side) and four trailing wheels.

The French system (now adopted by the UIC) counts the axles – not the wheels – so the Berkshires would get written 1-4-2.

India became home to a great fleet of steam locomotives. The network was built by different types of railway companies: Company-owned, privately-owned, owned by independent “Native” States, by sugar mills, by other private users with captive lines. They operated in various gauges and acquired their own rolling stock. Having pioneered railway business, Britain had a head start over all others. It was thus their locomotive manufacturing companies that provided these machines to India and all over the world. But as British sources began getting over-booked, India’s growing needs had to be met from different parts of the world and from its own manufacturing units. BB&CI’s Ajmer works began manufacture of P class MG locomotives as early as 1895 and EIR’s Jamalpur shops turned out its first loco in 1899. By the end of the 19th century, the variety of steam locomotives which plied in India must have been the largest assortment of different types found anywhere in the world.

Feeling urgent need for some standardization, a committee, which included our railway advisers (Rendel, Palmer, Triton – RDSO is its successor), set up the British Engineering Standards Association
(BESA) to evolve and suggest some designs. The first BESA designs emerged in 1903: 4-4-0 standard passenger (SP) and 0-6-0 goods (SG). Designs were revised in 1905-06 with more powerful locomotives, including the 4-6-2 heavy passenger (HP), the 4-4-2 Atlantic passenger (AP), the 2-8-0 heavy goods (HG) and two tank locos. Superheated versions (giving better fuel economy) were classified SPS, SGS, etc. and those converted from saturated to superheated SPC, SGC, etc. The SPS had driving wheels of 6ft 2in diameter – perhaps the largest in India. This is also how we got the HPS – to my mind the most elegant of all on our system, even though the WP that came later became an icon.

Within twenty years, the need for still more powerful locomotives was felt. The consultants designed them to a new Indian Railways Standard (IRS). IRS locos started coming from 1926-27. These were the X class locos: 4-6-2 XA, XB and XC (with increasing axle loads) for passenger trains; 2-8-2 XD and XE for goods and a 0-4-2 XT tank engine. But almost immediately some of these, particularly the XB, were suspected of causing track distortions and accidents which were attributed to their ‘hunting’ – lateral oscillation of the engine front to an extent to cause instability. The derailment of the Punjab Mail on July 17 1937 at Bihta when 119 persons died was attributed to such ‘hunting’ and these passenger locos were gradually downgraded.

In the 1930s NG locomotives in India acquired the prefix “Z” for 2 ft 6 in gauge (“N” for 2 ft gauge), MG the prefix “Y” and BG the prefix “X”. With the introduction of IRS locos X was changed to “W”. Prior to that, locomotive types sported their own personal lettering and numbering. The suffix “T” denotes a tank locomotive, that is, one which carried its own water tank and needed no tender for water or coal.

World War II caught the Indian Railways short of power. As British builders were again over-booked, orders were placed with North American manufacturers for the nearest equivalent to the XD and XEs which were serving well. About 225 AWDs, CWDs and the classic AWCs came from US and Canadian sources and proved to be so effective that not only were fresh orders placed after the war but one of the manufactures, the Baldwin Locomotive Works of Philadelphia, was given an order for a new prototype: 16 XPs were received in 1947. These became the first WPs.

In 1950 came the WGs, of which the first hundred units (Nos. 8301 to 8400) were built by North British
of locomotives. Initially the decision was to up-grade the Kanchrapara loco workshop into a manufacturing unit).

By 1968-69, when steam traction was getting phased out, there were over 10,500 steam locomotives on the rolls of Indian Railways (about 6,600 BG, 3,600 MG and 400 NG).

Among these locomotives, the largest we had in India were the Garratts. They are articulated and are effectively two engines joined by a common boiler. These are shown with a + sign between the arrangement of each engine. The notation for a “double Pacific” type Garratt is 4-6-2+2-6-4 (of this type, India had just one.) The heavily-graded BNR had 32 Garratts, which were like a pair of HGS class 2-8-0+0-8-2 locomotives (built 1925), 16 N class and 10 massive NM class 4-8-0+0-8-4 (built 1930–31, of which one, No 6594, stands in its green livery in the National Rail Museum) and four P class 4-8-2+2-8-4 (built in 1939). The metre gauge Assam-Bengal Railway had six T class 2-6-2+2-6-2 (built in 1927).

Three types were supplied when it became the Bengal Assam Railway: 10 MWGL class 2-8-0+0-8-2; 12 MWGH class 2-8-2+2-8-2; and 18 MWGX class 4-8-2+2-8-4. Of these last named, only 9 MWGX stayed in India. The others went to Burma; of which four were returned to the Assam Railway after the war. One MWGX is preserved at the Rail Heritage Park at Tinsukhia on the North East Frontier Railway.

Another of our 8-driving wheel locos was the HGS 2-8-0. A beautiful locomotive, one such won the first ever Black Beauty contest in Asansol. Acquired in 1922 from the same William Beardmore & Co., HGS 26761 came to the division from its parent Oudh & Rohilkhand Railway, when control of that railway was vested with the EIR. Homed in Madhupur shed, she served in the undulating Giridih coal pilot sections. Before retiring and until 1985, she did duty as a shunter and may well be among one of our longest serving locomotives. Restored in September 1999, she now runs the heritage train between Howrah and Bandel.

The true Indian freight work horse of which IR owned over 2000 was undoubtedly the WG. A Mikado class 2-8-2, it utilised identical equipment (boiler, motion, springs, tender bogies, and rear truck) as in the iconic pin-up girl of locomotives, the Pacific class 4-6-2 WP passenger locomotive with its distinguished bullet head. (The WP, designed for speed, had driving wheels of larger diameter than those of the WG, which was designed for its tractive effort and hauling capacity) Production of WGs ceased in 1970; the final unit, named Antim Sitara (Last Star) stands on a pedestal at CLW.

Except where nostalgic loco men have lovingly taken the trouble of restoring them, these beautiful stalwarts of a by-gone era will never be seen in service again. They will fast fade into memories only.

(Footnotes)

1 After the prototype WP was built by Baldwin in 1947, a further 300 were built in USA and Canada in 1949. In the late 1950s another 180 came from Chrzanow, Vienna. Finally CLW built 259 between 1963 and 1967 to complete a total of 755.

2 As mentioned, the first 100 came from North British and Vulcan Foundries in 1950. Then there were about 350 from Europe, North America and Japan. Finally, CLW built almost 2000, reaching a total fleet of 2450.

3 From The Statesman dated March 30 1910:“The workshop of the Eastern Bengal State Railway at Kanchrapara is now quite unequal to meeting all demands made upon it. It has been determined, therefore, to turn it into a Locomotive Works and to build new Carriage and Wagon Shops, additional land being acquired for this purpose at Kanchrapara. The total expenditure will be about 30 lakhs of which half will be charged to capital. Five lakhs will be spent in the financial year 1910-11.”
I had occasion to travel to the easternmost part of our country earlier this year (2015) in February. I was amazed and impressed by what I saw, what I experienced and the museums I was able to visit. However, I will limit this write up to the steam locomotives that I encountered in this corner of our land.

The most impressive, by far, was the Meter Gauge Garratt locomotive that I came across in the small well-laid and well maintained rail museum at Tinsukhia. Set up by one of its erstwhile DRMs, S. Mookerjee, in 2010, the museum has been named “Rail Heritage Park” and is a must visit for the steam enthusiast. The Garratt on display is the only Meter Gauge Garratt locomotive known to exist in India. Other than this, the only other known MG Garratt is one preserved by the State Railway of Thailand.

Over 27 meters long, this MWGX class locomotive weighed an impressive 104.24 tonnes when loaded. On its 4-8-2+2-8-4 wheel arrangement, it could reach speeds of 50 kmph and haul a load of 300 tonnes. Built in 1945 by M/s Beyer Peacock Company Ltd. of Manchester, UK, for use during the Second World War in Myanmar by the British War Department, at the end of the war it was transferred to the Assam Bengal Railway which later became the North East Frontier Railway. It was retired in December 1975. It was re-numbered a few times and at the time of its condemnation, it bore the number 32086 MWGX.

Another prominently displayed locomotive at the park is the B-class No. 781. This is one of the oldest locomotives of the Darjeeling Himalayan Railway and had been sold to the North Eastern Coal Fields in 1969. By the beginning of this century, it had become unserviceable. Thus, when NF Railway set up this heritage park, it was gifted back to the railway on the latter's request.

There are other B class locos on display at various locations. For example, there is one in the National Rail Museum and another in front of the Ministry of Railways, both in New Delhi. The uniqueness of this loco is its presentation. It has been placed atop a bridge pillar in the middle of a well-manicured lawn. The pillar itself is part of NF Railway heritage as it was one of the pillars of Meter Gauge railway bridge No. 556 between Naharkatia and Namrup stations. This bridge had been built around 1898 and just missed a century of life when the line was converted to Broad Gauge in 1997. The designers of the Rail Heritage Park were able to salvage this pillar and use it to display Loco No. B 781.

A third steam loco is on display in the Park. This is loco No. YP 2618, kept in a separate shed. The loco, of 1957 vintage, had been built by Tata Engineering and Locomotive Company Ltd. (TELCO). In its heydays, it worked all the important trains of the NF Railway including the Kamrup Express, Assam Mail and Tinsukhia Mail. The conversion of major sections of the railway to Broad Gauge and the ongoing dieselisation and electrification spelt its death knell and it was retired from service in January 1997 after working its last train, 252 DN, ex Ledo to Tinsukhia. With a 4-6-2 wheel arrangement, the YPs were the counterpart of the WPs of Broad Gauge.

My next stop was the museum of the North East Coalfields at Margherita. As you enter the Museum located right in front of the Margherita railway station, you see a string of three steam locomotives on your
left. Painted in various hues of green, yellow, blue and pink, they certainly do not appear to have their original colours but are definitely very pleasing to see now. They are neatly displayed and even have mannequins posing as drivers. Named Hassang, John and Shelley, they had been built by WG Bagnall Ltd. of Stafford, England in 1897, 1924 and 1930 respectively. All three have saddle-top water tanks and a 0-2-0 wheel arrangement.

A visit to the Tipong coal field not far from Margherita, I found a fourth example of the same WG Bagnall-built locos. This one has been named David and is again well-kept and preserved. In the same shed was also a B class loco, No. 796. One of the staff of the colliery who was present at the shed claimed that both these locos were in working condition. David was too well painted and clean to have worked recently, although it could well be in working condition. The B class loco, although not as spic and span as the Bagnall, did give the impression that it could work. However, I am giving the benefit of doubt to the colliery and assuming that the locos are in working order. There was one SAN diesel as well and in all likelihood bulk of the work is done by it and these locos used occasionally as and when required.

These are not the only steam locos one gets to see in this area. There is one more on a plinth outside Mariani station. This is a YG 3213. Built by TELCO in 1960, it worked extensively on the Lumbding and Tinsukhia Divisions of NF Railway before it was retired in February 1997. YG locos were the counterparts of the YPs for working goods trains. As a result they had a 2-8-2 wheel arrangement with smaller diameter driving wheels than the YP, which had a 4-6-2 wheel arrangement. Till diesels and conversion to BG swept the steams before them, the YG was the main goods loco of the MG system of the Indian Railways. Smaller and lighter locos were used only where the track or the bridges could not sustain the size and weight of the YG. At the time of its retirement, Loco 3213 was homed at Mariani steam shed.

I was sure that this Eastern area had more surprises when it comes to heritage steam locos. One of the surprises I got was at the Digboi Centenary Museum at Digboi. This is a museum of India’s pioneering Oil Company and its prime exhibit is the first oil well of the country, preserved in its original state. However, in one of the disused alleys at the rear of the
museum, I noticed what looked like a steam locomotive and closer examination showed that it was indeed a steam locomotive. It looked like one of the WG Bagnall locos that were on display at the Margherita museum but this one had no markings of any kind although I looked at it from every direction. It was the same size as the Bagnalls with the same wheel arrangement and saddle-top water tank. The length of the chimney and some of the other fittings also corresponded. The staff at the museum could not give me any details of the locomotive. There was an open wagon and some coaches also on this 2-foot gauge disused line. The only information that I was able to extract was that the steam loco used to carry trains of crude oil to the Margherita refinery between 1891 and 1901. The Margherita refinery was closed in the latter year.

I strongly recommend that all rail enthusiasts visit the North East to not only see the steam and other railway heritage that has been preserved but also its tea gardens, animal and bird life, oil and coal fields, etc. This is also the area where you will find relics of the 2nd World War, such as the cemetery near Jairampur in Arunachal Pradesh. You may also be able to see remnants of the famous Stilwell road from Ledo across the present Myanmar into China. Last but not the least, there is the powerful and massive Brahmaputra, certainly India’s mightiest river, that will make our other rivers appear to be mere drains or streams when they are at their best.
Chittaranjan Locomotive Works (CLW) was set up by the Indian Railways soon after India attained independence in 1947 at a green field site in the industrialised belt of West Bengal that borders Bihar. The transfer of technology was from North British Locomotive Company of UK and, if I remember correctly, the investment was a princely sum of Rs. 5 crores. The first steam locomotive, a 2-8-2 WG class, was turned out in 1950. These locomotives ultimately became the workhorse of freight traffic on the Indian Railways. It will not be out of place to mention that Chittaranjan Locomotive Works was the first Production Unit set up by independent India.

Apart from a wonderful layout and equipped with the best state of art machinery and plant, the workshop had a beautifully laid out colony. Undulating spacious green landscape with 7 lakes and well maintained roads made this colony very different from the cramped high rise cities one sees now. The only problem was that it was located in the wilderness and was totally cut off from the larger cities. The planners of the workshop and colony made up for this by providing, as in all such Railway Colonies, its own 200-bed Hospital, Clubs and Institutes, Schools and College up to Graduate level, Sport facilities with a Stadium and reasonably good Shopping Centres. There were Lawn Tennis courts, beautifully maintained, which are becoming rare now.

I was transferred to CLW in 1965. I was then a newly married young officer with hardly 1½ years working experience. This turned out to be the best thing that could happen in my professional career. CLW was in her heydays then, turning out 15 steam locomotives a month. There was an excellent Production Control Organisation which, without any computers, ensured in time availability of raw material, components and sub-assemblies. The layout of the Worksop and a well-positioned Store for raw material and bought-out components ensured smooth material flow.

Industry in India, particularly heavy industry, was in its infancy; the country was largely dependent on imports. CLW had to be self-sufficient and had very specialised machines for making Bar Frames and Boilers. The WG class of locomotives was basically of American design with Bar Frames and Steel-welded Fireboxes; our British locos had plate frames and Copper fireboxes. CLW developed excellent skills in welding to meet these requirements. This welding skill was later established when the neighbouring Hindustan Cables Factory needed our assistance in repairing their Lead Press which had developed a crack. We did round the clock welding to deposit one ton of welded material and got it going.

CLW also had very good Foundries, both Cast Iron and Bronze/White metal. There are not many steel castings in Steam Locomotives, but later, CLW also set up a large Steel Foundry.

I started my career at CLW as Assistant Production Engineer (Hot), which meant in-charge of the Hot Shops. After assignments in other areas, in 1968, five of us were selected to go to Germany for training in manufacture of Diesel Engines, since CLW had signed an agreement with MaK of Germany to make Engines for Diesel Shunters. In one of the best organised Training Programmes I have seen on Indian Railways,
we went through a 2-month German language course in Pune and then another two months in Saarbruecken, Germany. At MaK, our assignment was very clear. We had one year in which two of us were trained for the manufacturing part, while two got training in assembly, erection and testing. The fifth had to translate all drawings into English. Of course, we were all helped. On our return, were asked to set up the Diesel Engine Shop, which we did.

Though CLW had been making Electric Locomotives for some time, the coming up of the Diesel Locomotives really amounted to closure of Steam Loco building. The area allocated was where Steam Locos were built, so gradually we saw tapering off of the Golden Era of Steam Locomotives at CLW. In 1973, CLW turned out its last Steam Locomotive and we bade a sad good bye to this wonderful Iron Horse.

Chittaranjan was a rather isolated place; this resulted in friendship developing there amongst the families, which is something which does not exist in big cities, where one does not even know one's own neighbour. Our children get together even now, even when they are living and working in far flung corners of the world. When there is no distraction and there are good sports facilitates, everyone took up sports. The Club was very active and we had our own Bowling Lawns, a sport which is now practically extinct.
There is something about a Satpura narrow gauge train that sets apart the experience as exotic — an unforgettable ride that leaves behind a pleasurable sensation, a raw taste of what the ‘real’ India is like. Here you are surrounded by colourful tribal folk— the Gonds and the Bhils, the Adivasis and other tribes that the anthropologist is at pains to discover and unearth — and, albeit for a short while, a curtain is drawn aside revealing a rich tapestry of tribal life which the city dweller has never glimpsed before. The train rattles on bumpily over the points, the carriages heave and sway, the clunk-thud seems to blend in with the unfolding landscape; but the old man wearing a turban and his wife seated opposite gaze out of the window, lost in a world of their own. Their contact with this marvel of miniature railway engineering is but transient. An hour later they will have got off at a station set amidst the open countryside. The train hoots and begins to move. The man and his wife have begun their trek along a dirt road leading to a cluster of huts hidden from view by jungle and bush.

The origin of the Satpura lines can be traced to the early part of the twentieth century. Some ten years after the Bengal Nagpur Railway Company was formed, engineering surveys were carried out in the then Central Provinces with a view to open a low-cost railway that would unite the region into a whole. The object of the railway was two-fold. First, to open up the agricultural and mineral resources of the region; and second, to safeguard the inhabitants of the area should a famine arise. The gauge selected for the purpose was 2 feet 6 inches (762 mm) and the first link from Gondia to Nainpur was opened in 1903. In the years that followed, construction progressed, till by 1913 Nagpur was connected with Chhindwara by narrow gauge. The ‘Satpura Lines,’ as they had come to be known, were the largest narrow gauge system in the country. With over a thousand kilometers of track mileage, the railway linked together Jabalpur, Gondia, Nagpur and Chhindwara with extensions going as far as Nagbhir and Chanda Fort in the south.

The Narrow Gauge Railway Museum of Nagpur

The present trend on the Indian Railways is a futuristic one that looks to modernization and adopting a uniform gauge countrywide. Anything that is old and unserviceable faces the threat of extinction. Thankfully though, the DHR, the Nilgiri and the Kalka-Shimla lines have been exempt from this view. These tiny unremunerative lines meandering through hills and valleys are now a protected species; their survival continues owing to UNESCO world heritage status. Could not something of a similar kind be done for the Satpura lines of Central India? Having served the region for nearly a century, this legendary railway is now slowly passing into history. Here is a diminutive railway enterprise tailor-made to suit the needs of tribal folk in the heart of India, a miniature rail miracle that has been around for so long that it would be a shame to pull it apart summarily without giving a thought to the heritage value of the system.
The railways, it seems, were aware of this, and since they could not continue with a system that had outlived its usefulness they did the next best thing: they came up with a museum. For more than a decade now, the Narrow gauge railway museum of Nagpur has offered the visitor a rare peek into the past of India’s famed Satpura railway, besides being a much-loved amusement park where families may be seen to congregate in large numbers in the evenings. With its sprawling gardens spread over an area of over four acres, the museum is built over the site of the former South Eastern Railway’s Broad Gauge steam locomotive shed, and is a vast repository of vintage and antique objects that sets out to document the technology used on the Satpura and other narrow gauge railways since earliest times.

So, does the Nagpur railway museum succeed in conveying the true flavor of the Satpura railway? The casual visitor who drops in hoping to find a dozen or more steam locomotives in the yard waiting to be stroked on their backs is going to be disappointed, for he will find only three engines here, two of them housed indoors making good photography nearly impossible. But if we accept the view that a rail museum exists to depict the sum total of what a railway was like since earliest times, then the place at once takes on a new meaning.

Indoor exhibits at the museum include a large assortment of artifacts from a bygone age, kept in glass showcases. There are static models of locomotives and carriages on display, builder’s plates, signaling and permanent way equipment, hand-lamps and old telephone sets, locomotive fittings, and various other objects of interest. The archive houses a collection of rare stamps as well as old documents, locomotive specifications and diagrams and railway manuals.

Amongst the most delightful pieces on show indoors is a platform weighing scale made in 1897 by W & T Avery Limited of London and Birmingham and a signal lever frame from Saxby Farmer Limited dating back to 1899. And there is an ancient hand-point mechanism in the yard outdoors from Anderston Foundry Company Limited, Glasgow and Middlesborough, with a barely visible ‘BNR 1887’ appearing in relief.

Besides a diesel-hydraulic locomotive and a narrow gauge royal carriage built in 1899 by Orenstein Koppel of Germany, the principal attraction indoors is a Bagnall 0-6-4 narrow gauge tank loco weighing 15 tons and having a maximum speed of 25 kmph. This baby tank engine is no old junkie—built in 1916 by Bagnall Limited, Stafford, England, this loco was reconditioned for a heritage run in 2002, and can be seen resplendent in bright red livery and polished brass fittings.
Placed on a low ‘pedestal’ outside the main building is a 39.5 ton 4-6-2 steam loco manufactured in 1907 by the North British Loco Company, Glasgow, UK. Cross over the lawn and you find yourself in a little ‘yard’ complete with turnouts and a level crossing gate. Here you will find stabled a 1957 steam crane of Italian make coupled to a goods brake van, and on the adjoining track, an oil tanker, old goods wagons and heritage carriages in the usual maroon-red livery.

A Legend called Nainpur

No railway can hope to survive without extensive repair facilities. On the Satpura Lines, periodic overhauls were done at Motibagh, while routine maintenance of engines was carried out in sheds spread over the region. There were locomotive sheds at Howbagh (Jabalpur), Chhindwara, Nagpur, Nainpur, Nagbhir and Gondia. With the exception of Howbagh, each of these locosheds was furnished with an accident relief train and a 10-ton steam loco crane.

Turntables for reversing engines could be found at Nainpur, Howbagh, Nagpur, Chhindwara, Chanda Fort, and Gondia, each 50 feet in length, while triangles were provided at Katangi, Chhindwara, Khirsadoh, Nagbhir and Mandla Fort.

Centres of the busiest railway activity were, without a doubt, Chhindwara and Nainpur. Bill Aitken, exploring the railways, had been to the latter town, and he tells us of “…the satisfaction of seeing a steam locomotive back up to take us to Nainpur which in 1985 boasted of a locomotive shed that still homed ten ZEs. Like all narrow gauge carriages the fittings were old but full of character. The wooden seats of the lower classes gave a pleasant enough ride for me to have no regrets on that overnight journey which ended at 4 a.m. when the train, which was running to time, halted for water and a change of engine at Nainpur Junction.”

The narrow gauge enthusiast must gravitate to Nainpur just as the old countryman cheerfully turns to the pub on his way back home. On another occasion, while at Nainpur, Aitken had the unpleasant experience of being ‘chased away by censorious security men.’ A most unfortunate experience for a man possessing an official permit allowing the use of a camera — and perhaps the reason why his book does not have a single picture from this busy little railway town.

Being then the focal point of the Satpura railway, Nainpur was a place of concentrated railway activity.

With four routes radiating outwards, Nainpur (like Chhindwara) was fully equipped to deal with any contingency that arose. Its station had two platforms, one low-level, the other rail level; six reception lines and loops long enough to hold about 20 vehicles each. For the student of narrow gauge railway operations, no other station offered as much scope in terms of equipment, infrastructure and staff.

Signaling and Telecommunication

Railwaymen are a business-minded lot and when a line is constructed, the size chosen is dictated more by practical considerations than by anything else. Before a line can be laid the first thing to do is to make a thorough study of the region in terms of its industry, population, trade, natural resources and geographical features. These details together with a preliminary study of the various possible routes along
which the railway may be laid enable a calculation to be made of the cost of constructing the line as also the revenue it is likely to bring in. While the broad gauge may seem superior to every other gauge in terms of speed and carrying capacity, it does not offer the most economic rail solution in every case: if the amount of traffic expected is small, laying a meter, or even a narrow gauge line would appear to be more justified from a practical standpoint.

After being around for more than a century, the Satpura railway is now on the brink of extinction with many of its lines already converted to broad gauge. But what remains still delightfully retains the flavor of a heritage railway. You can still find a pointsman walk up to the track and set the route whereupon a pretty little ground lamp will be found to flip its face towards you. And Station Masters along the line still use Neale's token instruments making their entries in a voluminous train register maintained in the office.

Signaling on the narrow gauge was based on the traditional Lower Quadrant semaphore system. The usual signaling arrangements at a station would include an Outer signal with a Warner below it, a Home, Starter and an Advance Starter. A Warner has a fishtailed arm and its main function is to indicate to the driver if a reduction in speed is called for. When a train runs through a station (and this was a rare occurrence on the Satpura lines) the Warner arm was dropped indicating that the driver could proceed unhindered. Sadly, not all Station Masters follow this injunction and the South Eastern Railway rule book has a stern warning for offenders: “Warner signals are not always lowered for trains booked to run through. It should be impressed on all cabinmen that this is a serious offence as such a practice reacts very adversely on the speed of such trains.”

The earliest electrical instrument which enabled a Station Master on the line to instantly confirm the status of his section to his colleague in the rear was the electric telegraph. In later days, Neale's token instruments were installed to exchange line clear messages. But for several years to come, even after Neale's instruments had come into use, line clear messages had to be telegraphed in addition. The Satpura timetable of 1975 has specific instructions for Station Masters along the line. For non-interlocked sections of the railway it clearly warns, “Avoid short cut methods. All line clear messages must be telegraphed in full.”

Railway rules for signaling provide interesting material for contemplation and study. For example, all Down trains proceeding from Chhindwara towards Nagpur are expected to stop at the Outer signal of Kukrakhapa station, 36 kilometers down the line. After halting at the Down Outer, the driver whistles, after which the station master on duty lowers the signal for the train to be admitted to the station.

Communication on running trains was facilitated by portable control field telephone sets. A field telephone of this kind was provided in the brake van of narrow gauge trains; when connected to an overhead telephone line it allowed train staff to get in touch with Control during an emergency. Another interesting device used was the magneto telephone illustrated here. This had a hand-operated generator for giving a ring and provided a link between stations masters on the line and gatemen manning level crossing gates.

The Romance of Shunting Trains

Other than Passenger trains and Goods services, the Satpura railway also had Mixed trains on its timetable. A mixed train is a composite of passenger coaches and goods wagons; its operation makes absorbing study because it has work to do in the form of shunting at wayside stations along the route.

Consider the working of 1 NR Up/2 NR Down. This was a mixed shunting service between Nagpur and Chhindwara, and yet a passenger embarking at Nagpur could travel on this train only as far as Ramakona. Each day 1 NR Up (Nagpur—Ramakona) leaves Nagpur with a set of passenger coaches and goods wagons. After journeying for over seven hours, the train pulls into Ramakona at 8 p.m. where
coaching vehicles are detached and stabled on a loop. However, it has by no means reached the end of its journey. The engine has work to do here: switching over tracks it picks up two full water tanks and returns to the main goods train resuming its onward run (minus the coaching vehicles) at 9 p.m. On the way, it deposits one water tank at Bheemalgondi, the other at Kukrakhapa, besides picking up parcels traffic and wagons at stations en route, finally reaching Chhindwara at about 2 a.m.

In the down direction, 2 NR Down leaves Chhindwara at 2.30 in the morning with only goods wagons. On the way it picks up water tanks at Kukrakhapa and Bheemalgondi (now empty) reaching Ramakona at 7 a.m. There it deposits these tanks to be filled up and picking up the coaching vehicles left earlier by 1 NR, it proceeds with its load of goods wagons and passengers towards Nagpur.

Safety in Operations

Unlike the motor car, a railway is a form of guided transport. When running at speed a train develops a tremendous momentum making instant stopping impossible. This coupled with the fact that steering as in an automobile is not possible has made it necessary for an elaborate system to be devised to ensure safety.

Serving a total of over 120 stations spread over a route length of about 1020 kilometers, the Satpura railway of yore was the largest narrow gauge system in India. Ancient timetables, both public and working, are always a pleasure to study, listing stations and stoppages besides providing a wealth of information on various matters of interest. Some very pretty station names emerge from a perusal of these old documents: Hatta Road, Padregunj, Binaiki, Shikara, Chiraidongri, Ram Rama, Saongi, Tempa, Devi ....

Consider the stretch of track from Nainpur to Chhindwara. This 140-kilometer long route has two ghat sections where the line crosses the Mahadeo hills of the Satpura range. Abbreviations following station names give interesting insights: ‘W’ stands for Watering Station, of which there were a total of about forty on the railway. The duration of a halt for engine watering depends on the class of train: 12 minutes for a Passenger train, 15 minutes for a Mixed and 20 minutes for a Goods train. Other abbreviations found in these timetables include E for Engine Changing Station, N for Notice Station, PH for Passenger Halt, R for Restaurant, S for Tea stall, Sg for Siding, BS for Block Station, V for Vegetarian Refreshment Room, and NV for Non-vegetarian Refreshment Room.

Not all sections of track can handle a train at full speed and for safety reasons, speed restrictions are sometimes imposed on the movement of trains. The most common cause of such a restriction is a scissors crossover where narrow gauge trains are limited to only 10 kmph. Other causes leading to a speed limit include passage over a siding point, old and worn out rails, scanty ballast, weak girders over a bridge and reverse curves on steep gradients.

Another interesting area of safety in operation is the interlocking of level crossing gates with signals. Between Itwari and Nagpur for example, you had two level crossings each interlocked with banner type signals placed between broad gauge and narrow gauge tracks, 180 meters short of the first level crossing in either direction. These signals apply to trains approaching on both BG and NG tracks. When a driver comes up against a level crossing signal at danger, he has to come to a dead halt at the signal and blow his whistle at short intervals. If the signal is not lowered after 2 minutes, drivers are required to
proceed cautiously while being prepared to stop short of the level crossing.

At other places, level crossings on the railway were protected by gate signals preceded in the rear by Warner signals or signal sighting boards.

The Satpura line has a number of Ghat sections. These include Ramakona-Umranalla on the Nagpur-Chhindwara Section, Bhoma-Seoni & Karaboh-Jhilimilli on the Nainpur-Chhindwara Section as well as Pindrai – Ghunsore, Binaiki – Shikara & Gowarighat - Howbagh (Jabalpur) on the Gondia-Nainpur-Jabalpur Section.

The passage of a train over a downward grade on a ghat is always fraught with danger and to ensure safety, mixed and goods trains had to halt at engineering stop boards placed at the commencement of such sections and the driver required to 'pin down' brakes before resuming his run. Each such stoppage would be certified by the Guard by an entry made in his Train Report. For such trains, the rules lay down that not less than 70-75% of the vehicles on the train should be fitted with active vacuum brakes operative from the engine.

Passenger trains, in contrast, were fully vacuum-braked, and were, therefore, exempt from the procedure of halting and pinning down brakes on a downward grade.

For added safety, vacuum log registers were maintained at select stations in ghat areas. Station Masters on duty were required to personally check the vacuum gauge of the brake van jointly with the Guard before handing over the line-clear ticket to the driver of the train and record the results in the vacuum log register obtaining the Guard’s signature in token of the correctness of the entry. The minimum vacuum recommended was 15 inches in the brake van.

Train operation on the Satpura railway may thus be seen to be based on definite rules worked out with the greatest care and forethought.

When it was first conceived, one of the prime objectives of the Satpura Lines was to tap the agricultural produce of the region. A hundred years later, that area of commerce has been taken over by road transport leaving the narrow gauge free to devote itself entirely to ferrying the habitual traveler to his remote country destination. Within a few year's time what remains of this quaint little railway, too, will have vanished without leaving a trace behind other than a few select remnants preserved in the Nagpur museum. And with it will come to an end the saga of the narrow gauge rail adventure that first began when a colonial administration sniffed at the untapped resources of India's tribal heartland. There was much enthusiasm in the air when the railway was first begun. “All the passenger coaches are fully vacuum braked and lighted with Pintsch's incandescent gas,” said one brochure of 1908. “The first and second class composite carriages are replete with every convenience for comfortable travel ... The ceilings are of millboard painted white, and pleasing effect has been secured by the introduction of strips of metal worked into various geometrical designs ...” It was an age of new ideas, an age of optimism, where the steam engine led the way bringing in prosperity and progress wherever it went. The little train was a complete success. It sped along all through the day and late into the night, passing through obscure little towns and hamlets, bringing the blessing of mobility to a rural clientele, whistling a message of cheer and hope as it went along. Fisherman or farmer, day labourer or schoolmaster – all rejoiced at the sound of its approach.

That was the Satpura railway. On the eve of its departure let us salute the little train. Au revoir!

(Footnotes)

This article was written in the middle of the year (2015). Subsequently, Narrow Gauge operations on the Nagpur-Chhindwara, Chhindwara-Nainpur, Nainpur-Mandlefort and Balaghat-Nainpur-Jabalpur sections have been closed owing to conversion to Broad Gauge - Editor
Formed in 2012 and launched in 2013, APHTRO (Asia Pacific Heritage and Tourist Rail Organisation) was set up primarily to help in improvement of the heritage railways and museums of the Asia-Pacific by forming a co-operative organisation to unite nations and countries of the region. It provides a forum where the countries can share their experience and exchange ideas, advice and information in any of the diverse aspects of rail heritage and tourism. APHTRO aims to play an important role in contributing to the growth and development of the heritage and tourist railways in the Asia-Pacific region.

The aims and objectives of the organisation and the roles it can play are as follows:

- To represent heritage and tourist railways and museums in the Asia-Pacific region. It is a non-profit making body.

- To provide a discussion forum for meetings, newsletters and website to share and exchange any experiences, ideas and information.

- To promote the sustainability of its members and to support the operation of members’ activities by:
  - Making submissions to and liaising with governments or local authorities as and when requested by its members.
  - Providing access to advice, assistance and information on technical matters, marketing area, etc.

- To generate good relationship for mutual benefit with other international organisations of the heritage and tourism sector.

- To explore and formulate bi-lateral/multi-lateral funding/programmes.

The aims and objectives of the organisation and the roles it can play are as follows:

- To convene an Annual General Meeting and to promote conferences with relevant themes.

With Thailand becoming a full member during the course of the 2015 Conference, the organisation now has 10 full members. These members are: Australia, India, Indonesia, Japan, Jordan, Malaysia, New Zealand, the Philippines, Taiwan and Thailand.

The Indian Steam Railway Society (ISRS) participated in the Annual Conference of APHTRO for the first time this year, being represented by J L Singh and Ishwar Singh. The Conference was conducted in Bangkok, Thailand, from the 21st to the 23rd of October 2015.

The morning of the first day of the Conference, i.e. the 21st of October, was devoted to the opening of the conference, the inauguration of the Thai Rail Foundation and the Thai Rail Museum along with other similar activities. The latter included a book launch as well as a panel discussion. Later in the day, all delegates were taken to the Thonburi Depot where 5 steam locos are being maintained and kept in steam followed by a visit to the Siriraj Bimuksthan museum.

The venue of the opening of the conference is was the concourse of the Hua Lamphong railway station. This
is the main railway station of Bangkok city. The concourse is about 50 meters wide and perhaps 75 meters in length. There are shops on each side of the 75-meter lengths except for a gap on South side from where you enter the concourse. You can enter the concourse through the shorter length as well. This is the side that faces the East, while you enter the platforms from the concourse through the shorter length on the other side. The State Railway of Thailand (SRT), who were the hosts for the conference, did not close the area to the normal public so that any member of the travelling fraternity who was interested could also take part in the proceedings. A small stage had been set up at one end and seating arranged for the delegates in the middle of the concourse. Behind the seating for the delegates, a photo exhibition had been put up and also a small model railway installed. On both sides of the area where the delegates were seated were normal chairs for passengers and a large number occupied these chairs while the conference proceedings were in progress.

The conference began with a welcome address by Dr. Siripong Preutthipan, Chairman of the APHTRO Thai Working Committee and Chairman, Thai Railway Foundation. This was followed by an introduction to APHTRO by Mr. Kyoichi Oda, President of APHTRO. The inauguration of the conference as well as the main address was by Mr. Wuthichart Kalyanamitra, Governor of SRT. Unlike the lighting of the traditional lamp that is the usual means of starting proceedings in India, SRT gave a touch of railroad operations to the opening by the ringing of a bell of the type that is used to signal the arrival and departure of trains at railway stations. An ornate brass bell, bedecked with flowers, had been set up on the stage for this purpose. All VIPs on the dais rang this bell three times to formally launch the conference.

Immediately after this, we were moved to another part of the station towards the front side where the Thai Railway Foundation was inaugurated along with the Thai Rail Museum. The museum is very small by Indian standards but one of the interesting exhibits is a Neale's Ball token Line Clear instrument. This instrument had been manufactured by Saxby and Farmer (India) at Kolkata. The date of manufacture was not clear from the instrument but it was certainly not later than the 1950s or 60s. We were also introduced to a photo exhibition and a model railway that had been set up in the main concourse behind the seating area. A large screen was playing movies of SRT and its heritage railways and a live band was in attendance that played later in the day.

After a small break for tea and snacks, there was a panel discussion in which Mr. Kyoichi Oda, three members of SRT and two bloggers/columnists/train travellers participated. The topic was train tourism. Various means of promoting train tourism and problems facing this area were discussed.

At the end of this discussion, a book on the Steam Locomotives in Thailand was launched.

After a sumptuous lunch hosted by SRT, we were taken in vans to the Thonburi Depot where SRT homes 5 steam locomotives. Two of these locomotives were coupled back to back and we were informed that these locomotives are used coupled like this on the train so that the need for turning is avoided. These two locomotives, Nos. 824 and 850, are both Pacific type
4-6-2 wheel arrangement locos, imported from Japan, as were all the other steam locomotives that we saw. Both locos are oil-fired but gave the impression that they have been converted to this means and were not initially built that way. The other 3 locos were in the shed undergoing repairs. One, No. 953, a 2-8-2 wheel arrangement Mikado locomotive, was being converted from wood firing to oil firing.

From the depot, we were taken to the Siriraj Bimuksthan museum. The museum is essentially a medical museum set up by the Siriraj Hospital. It has a small section devoted to the railways as well. This has been done as the land on which the museum is constructed belonged to the railways and was the site of the old Thonburi station and railway yard. The area was destroyed during the Second World War and a new station built at the present site a little distance away. The railways then permitted the museum to be constructed here with a small section on the Railways. One of the features of the museum was a 3-D film on the old Thonburi station and the destruction that had been wreaked during the war.

The second day of the conference was the formal session conducted in the Meeting Room of the SRT Headquarters. Dr. Siripong Preutthipan chaired the session along with Mr. Kyoichi Oda. After welcoming remarks by the former, the latter conducted the proceedings.

The first item on the agenda was inducting a new full member, Thailand, represented by the SRT. Following this, Council members of SRT were re-elected. Mr. Rajesh Agarwal of the Indian Railways is one of the Vice Presidents. The other of the two Vice Presidents is from Taiwan. Mr. Kyoichi Oda is the President. This was followed by a revision of the APHTRO constitution, presentation and passing of the Annual Accounts and Budget. A resolution adopting the Bangkok Charter was passed. Dr. Preutthipan was to present a paper on the Thai Railway Foundation and Museum in the afternoon session but owing to his being preoccupied at that time, he made his presentation in the morning itself.

This took us to lunch that was hosted by SRT. After lunch, the time was devoted to presentations by various delegates. The first was one on Heritage and Tourist Trains in Thailand by Ms. Kanrawee Thongpull of SRT. She had participated in the ISRS conference in February this year and talked on the same subject. The next presentation was on ISRS by J L Singh. During this presentation, J L Singh covered not only the activities of ISRS but gave an overview of rail heritage on the Indian Railways including a brief on the National Rail Museum.

This was followed by a presentation on the Engines of Ecotourism in Southern Luzon by Mr. Alberto Nual of the Manila Railroad Club, Manila. An interesting presentation on European Heritage Railways and their political representation by Mr. Heimo Echensperger, Vice President of FEDECRAIL, followed this. Mr. Echensperger gave us an idea of the kind of issues faced by heritage railways in Europe and the political structure that has been set up to take care of them. One major difference between heritage railways in Europe and Asia is that the former is spearheaded by volunteers. As of now, this does not appear to be feasible in the Asia-Pacific, except perhaps in Australia and New Zealand. Government support is a virtual pre-requisite in our part of the world.

The last presentation was by Mr. Rajesh Agarwal wherein he made the announcement that the next APHTRO conference would be hosted by India in 2016.

Later in the evening, we were invited to a formal dinner hosted by APHTRO.

The last day of the conference was devoted to an excursion by a steam hauled train to the erstwhile capital of Thailand, Ayudhaya. This was not a special train for the APHTRO conference but a normal steam heritage train that runs on this day each year. Seats had been booked for the APHTRO delegates in the last coach that was coach No. 10. The two Pacific
Locos, polished and clean, were at the head of the train and passengers and tourists were permitted to photograph the locos and the train. This day, October 23rd, is selected for this run as it is a public holiday to mark the passing away of King Chulalongkorn, also known as King Rama IV. The reign of King Chulalongkorn was marked by several major reforms and significantly, the opening of the rail line between Bangkok and Ayudhaya more than a hundred years back. SRT runs steam excursion trains at least four times a year: on this day; on the birth anniversary of the present King, Rama IX; on the birth anniversary of the present Queen; and on the anniversary of SRT.

I was very impressed by the condition of the steam locomotives. Apart from being neat and clean, I could see no leakage of steam or water. With 10 coaches, they were able to reach speeds of 50-55 kmph and gave no trouble whatsoever during the run. The beat was perfect with no missed beat or distortions. Unfortunately, they did not allow us to footplate so that we could see the locomotive only from the outside.

The train steamed out of Hua Lamphong station at 08.06 hrs. and arrived at its destination at 11.15. The first part of the journey was through the suburbs of Bangkok but the later part was through the countryside with extensive rice fields. At Ayudhaya itself, SRT had arranged visits to various tourist sites, of which there are many. So many and of such importance and significance that Ayudhaya has been listed as a World Heritage site by UNESCO. For the return journey, we drove by vans to Bongpa-In station, a little distance from Ayudhaya main station. The train arrived at this station at 17.10 and left at 17.14. We arrived at Bangkok Hua Lamphong station at 19.30. The return trip was also steam hauled.

Overall, a very satisfying experience of a Conference well planned and managed. SRT did an excellent job on both counts. In addition, their hospitality was of the highest order. Among other areas, their time management was very good and all events started and ended on time. Having an organisation as APHTRO is a good beginning by the Asia-Pacific region when almost all such organisations are Europe or North America based. The result is that the standards and norms that they set are either not applicable or of little use for countries of this region. The issues raised in Europe will be quite different from those that are faced in Asia. It will perhaps be in our interest if India supports APHTRO to the maximum extent possible so that it becomes a viable alternative to similar organisations in the Western Hemisphere.
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