



## RAISING FUNDS FOR REPAIRS

PLEASE HELP US GET OUR IRON LADY BACK ON THE RAILS

### 1). DONATIONS DRIVE REPORT :

For those that have donated or committed so far, thank you very much!

DONOR:	DONATED:
Aidan McCarthy	R 1,200.00
Alan Lawton	R 8,000.00
Allan Waterston	R 250.00
A.J. Hamill	R 500.00
Andrew King	R 20,000.00
Book and DVD Sales	R 2,080.00
Bryn Morgan	R 270.00
Carl de Campos	R 500.00
Francois Lubbe	R 250.00
Geoff Cooke	R 250.00
George Hoddinott	R 1,603.30
Greg du Plessis	R 569.42
Hannes Paling	R 5,000.00

DONOR:	DONATED:
Henry Lazenby	R 250.00
Kenneth Allen	R 300.00
Lee Gates	R 10,000.00
Les Smith	R 250.00
Nicholas Goodale	R 1,000.00
Perry Maskell	R 2,000.00
Peter Micenko	R 2000.00
Philipp Maurer	R 1,111.00
Sandstone Estates	R 500.00
Stewart Currie	R 3,000.00
Tony Elliot	R 100.00
Wally Hoddinott	R 600.00
Total Given:	R 61,583.72

DONOR:	COMMITTED:
Book and DVD Sales	R 60.00
Coen Pretorius	Still to decide
Diana Sanderson	Still to decide
Dylan Knott	Still to decide
Lee Gates	2 <sup>nd</sup> Donation. R2000

DONOR:	COMMITTED:
Richard Niven	Still to decide
Robert Cousins	R 500.00
Shaun Ackerman	R 1,000.00
Stewart Currie	2 <sup>nd</sup> Donation
Total Committed:	R 3,560.00

Total for project so far is R 65,143.72 over R 60,000 (Rands only)

ITEM:	EXPENDITURE:
25L Matt-Black Primer Paint (Boiler Shell)	R 1999.00
Peter Micenko. R 1000.00 of R 2000.00 donation is to be put towards 15CA re-flue project.	R 1000.00
Cash in Hand (Rands) :	R 61,584
Total Expenses (Rands) :	R 2,999
Remainder in Fund (Rands) :	R 58,585



We have met our 2<sup>nd</sup> target of R60 000 for the restoration of this locomotive and thus a hearty well done AND a thank you to all that were involved. This is great! We may end up having to go over target because of unexpected expenses – but that is a result of the inexperience of our team in raising funds and in being a bit too keen to get the project rolling.

But for now we have the funds to get the essential repairs done to the firebox's foundation ring and to patch the firebox corner, including visits from the Boiler Inspector as necessary. So far, we have managed to synchronize his visit with those required for the Class 12AR No.1535, which is undergoing replacement of eight worn boiler tubes at the moment.

We have been experiencing problems in finding suitable qualified welders for the job. An individual who says he is a certified welder needs to present his documents and a welding plan to the Boiler Inspector, after reviewing the repair work required on the locomotive itself. Some of these guys just don't have the right papers, while others are using procedures culled from third parties.

Originally, Babcock was going to help us. But our project nudged into their work timelines and so they had to pull out. They had also given us a very reasonable price upon which we based our first and over-optimistic project cost estimate. (Which was before we discovered the crack in the foundation ring, which threw the costings out even worse.)

The boiler inspectors, Dawie Olivier's people, DO support steam preservation – but take an admirable hard stance in terms of safety for our aging boilers. It is a bit heart breaking at times, but when you are messing with a pressure vessel that reaches over 14 tons sq. meter, you definitely DON'T want a catastrophic failure! A boiler explosion, or severe injuries/death to a crew member due to scalding, will put a stop to Reefsteamers' operation and possibly all of South Africa's preserved steam. So the stakes are a lot higher than just our personal safety and trying to get another locomotive going.

Based upon the advice from the Boiler Inspector, we can start trimming and finishing the patch. Said patch has recently been forged into the corner shape required, courtesy of Andrew King's old firm, Bosworth Engineering. (Thanks, guys.) At the time of writing, a sample of the forge-bent boiler plate is being tested to ensure that the heat of the forging process did not degrade the necessary metallurgical quality of the steel plate.

The cut-away patch area still needs some cleaning up though as we still have some occupied stay holes. Luckily, we have the equipment and the expertise to make our own firebox side-stays. We also have numerous flexible stay caps and washers in the stores, although they will need cleaning up, as they are somewhat rusted from careless storage at Millsite.

The locomotive's front end has proven to be rather leaky, with a patch on the smokebox door plate as well as a failed saddle seal. The smokebox door patch appears to have been welded skew, as well as being distorted from the heat of the process.

It still needs to be removed and then we can discuss repairs, pressing, shimming, or perhaps borrowing a front cover plate from a scrap 15F. But the latter option isn't as easy as it sounds, as you often find detail differences in decades-old engines. We might find ourselves wrestling with a whole new set of problems with a 2<sup>nd</sup> smokebox front plate that doesn't fit for some reason! Better the plate that you know!

We could, of course, just scrape out the old putty around the front flange of the smokebox and put some fresh lashings of viscous gunk in of our own! And then apply lots of heat-resistant silver-coloured graphite paint to hide the resultant groove. But that is NOT the way Reefsteamers that does things! And that putty will always be a booby trap that is prone to sudden failure when it cracks and falls out – which could be at the far end of a long distance trip somewhere.

We don't expect the smokebox cover repair/replacement task to add to the financial cost of the project – it will just use up more of our time. It is, however, essential work as the locomotive will otherwise just knuckle-under and die on the main line if she cannot draw a draft to keep her fire hot.

**2). PROJECT SUMMARY, CLASS 15F NO.2914 RESTORATION :**

Note : This section was written for SA Rail and for the Uloliwe On-Line Magazine.

The Class 15F locomotive No.2914 is taken care of by Reefsteamers and is unique in being the last intact coal-fired 'hand bomber' Class 15F locomotive in South Africa. Our 14-wheeled-Fraulein was 'born' in Germany in 1938, the 5th of 14 15Fs built by Henschel and Sohn. At an eventual 255 in number, the Class 15F were once the most numerous locomotive class on the South African Railways. They were a successful and versatile heavy mixed-traffic design, which became legendary around the world. Class 15F No.2914 was never built or retro fitted with a mechanical stoker.

Class 15F No.2914 was never allowed to go derelict towards the end of steam. Unfortunately for this machine, crews at the time found her mechanically-stoked sisters to be easier to use on the longer distance trips then operated for steam enthusiasts and tourists. No.2914 fell into some decline. Although kept functional and receiving the essential maintenance required, she became somewhat shabby looking and received numerous bodged repair jobs.

Those poorly executed repair jobs affected the locomotive's steaming ability, making her even less popular – she even ran with the name 'The Ugly Duckling' for a while.

Reefsteamers last ran this locomotive in October 2007, to make use of the remaining time then available on the 3-year boiler certificate. She distinguished herself by blasting chunks of concrete from the chimney stack on the way home and the fire just would not burn thereafter. Although she made it home, she was quietly laid aside into safe storage, as there were more important projects to be done at the time. An examination by our Engineering Manager determined that the rear firebox corners had thinned, which is a known weak point on the old 15F's.

Thus, the tired old locomotive has been stored and out of use for over 4 years.

In the meantime, Reefsteamers gained an enthusiastic young fireman called George Hoddinott (aka 'Hoddi' or 'Hott-Nutts') – who has distinguished himself by genuinely preferring to hand-fire rather than use a mechanical stoker. He has, in fact, hand-fired the mechanically stoked 15F No.3046 from Ficksburg through to Bethlehem, with a constrained firing portal that is known to be awkward even with the locomotive quiescent at standstill. Not only did he keep the locomotive in steam, but we made it through to our destination at a cracking good pace and yet with a notable saving of coal.

Anything we can do to save money is of interest to Reefsteamers and we had already started focusing on the smaller engines as a long term business plan, rather than the glamorous but hungry 15Fs and 25NCs.

Under the guidance of the Reefsteamers Engineering Manager, Andrew King, George took it upon himself to see 15F No.2914 properly repaired and put back into steam as a representative of a large hand-fired SAR locomotive. With careful examination, only one firebox corner proved to be too wasted for safe service. With a donation of properly graded steel plate and the anticipated coal savings, the job became a lot more financially viable.

Reefsteamers now has a good-sized batch of young firemen and trainees who will be able to hand-fire that beast of a loco.

Work started on the locomotive in January 2012. The project has since gained momentum and a team of young men, none of them originally from the railways, have been steadily stripping and working on the locomotive. George has a technical background but is working with the Engineering Manager anyway, and all the documentation, drawings and procedures required by the Boiler Inspector are being adhered to.

Because of the awkward position of the new patch that would be required, the locomotive's cab needed to be removed. And the boiler cladding needed to be removed from the boiler to check for suspected weeping points and other possible failures.



Thus, the locomotive is getting a jolly good above-walkways strip-down and the opportunity is being taken to de-rust and seal the boiler barrel, replace all the aged thermal lagging and putting on brand new cladding sheets, with top quality duco paint.

She is basically getting the restoration to which she should have been treated decades ago!

When the damaged area was cut away within the firebox, cracks were found in the foundation ring, which have slowed the project down a bit. But the rest of the boiler has been visually inspected and appears to be sound. The smokebox had some surprises for us, including a patched cover plate sealed with window putty. The various failed seals at the draft-end account for the locomotive's poor performance.

Certified welders are being sought and quotes made for the welding repairs on the firebox. Meanwhile the entire boiler shell has been exposed and is being prepared for a good quality undercoat. We are about to open up the smokebox to investigate the various leaks and failed seals. Mechanically, the locomotive is in fair condition, although we will likely replace the valve motion bearings with Vesconite, a practice that we have found to be very successful on our other main line locomotives.

When this 15F is put back together and is in steam again, she is going to be a stunner and can finally leave the hateful 'Ugly Duckling' name behind. Just wait until we get her going, double-headed with our equally good looking Class 15F No.3046 – doubled headed F's will again grace South Africa's rails!

Due to financial constraints, this project is being funded entirely by donations. A fact probably not realized by many steam enthusiasts is that the hire of the certified welders and the use of the Boiler Inspector's services often cost more than the materials consumed. If you would like to donate some funds and be a part of this exciting project, you may can deposit funds into our bank account at :

Account Name =	Reefsteamers Association
Bank Name =	First National Bank
Branch Name =	East Rand Mall
Branch No. =	253 442
Account No. =	621 280 068 23
SWIFT =	FIRNZAJJ
Reference =	15F-2914 - <Initial and Surname>

All donations will be credited. The funds given are ring-fenced for the use of 15F No.2914 only. Extra monies not used for 15F No.2914 will be assigned to the 15CA No.2056 boiler re-flue project, which will be the subject of a European-based donation drive.

Although we will confirm all payments with the bank statements, if you choose to make a donation to this cause, please notify Lee Gates at [15F.2914@reefsteamers.com](mailto:15F.2914@reefsteamers.com)

Reefsteamers has a Facebook Page dedicated to this locomotive's restoration at <https://www.facebook.com/groups/387773301244867/> and our main website is [www.reefsteamers.com](http://www.reefsteamers.com)

This project is also covered in Reefsteamers' depot reports and articles which are distributed for free via bulk email. If you wish to be included on the Reefsteamers' Guest Emailing list, or to supply someone else's name to be included, please contact Lee Gates at [documenter@reefsteamers.com](mailto:documenter@reefsteamers.com) .

See picture album overleaf.

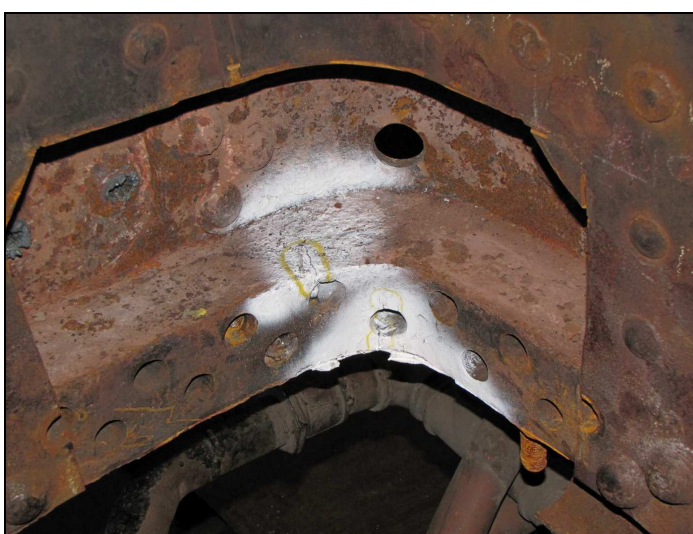




P01 - Class 15F No.2914 in steam, then named Elize. (Picture – Aidan McCarthy.)



P02 - At the start of the job, after stripping the fire arch and the grates for inspection, the cab had to be removed to provide access to the firebox's corner. Here, seen through the driver's window of the disembodied cab, the strip-down gang is planning their first angle of attack. (Which would be the firebox throat plate covers – Aidan McCarthy had already exposed the firebox's tapered flanks during the previous weeks.)



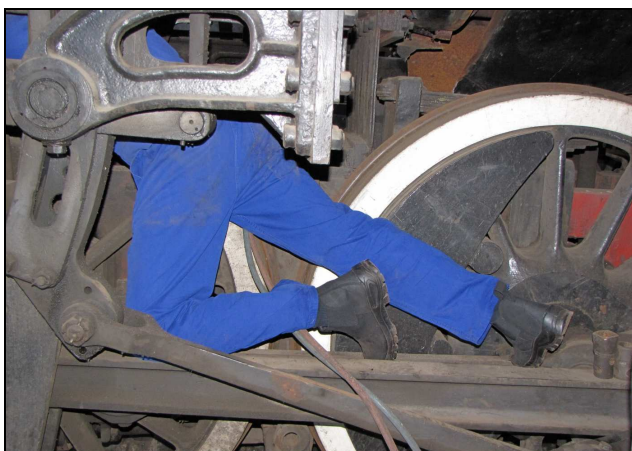
P03 - This is a view of the RHS rear firebox corner with the thinned section already cut away. Visible against the white paint are two of three revealed cracks in the foundation ring. A new plate of certified steel has been procured and has just been forged to fit the corner. It now needs to be recertified to confirm that the heating required for the forging has not degraded the metallurgical properties of the patch. Meanwhile, we are seeking quotes for certified welders to grind and weld those cracks closed and later, to install the patch for us. The staying and riveting work will be done by us.



P04 - A busy 15M workshop scene – 23 June. It was the thinned firebox corner that precluded getting a new boiler inspection back in 2007. (We assumed that both corners were ‘wasted’, but only one was too worn for further service.) But on her last run, the locomotive was firing chunks of concrete out the chimney and barely drawing a draft. The saddle seal had been made with ordinary concrete instead of refractory cement, and the smokebox front plate was leaking badly. Notice that the locomotive’s cab has been removed – and a substantial part of the cab floor framing and the ash pan had to be cut away to access that firebox corner.



P05 - The locomotive was known to be full of half-baked repair jobs. We found that several of the boiler cladding sheets had been incorrectly tack-welded together at the bottom edges, as well as being incorrectly bolted, riveted and welded in other areas. It had all been forced together. Here, a patient ‘Hott-Nutts’ is pictured cutting extra spot welds in the confined (and gritty) space under the second course of the boiler.



P06 - George’s other end in a MOST uncomfortable position. In theory, the cladding plates should be ‘floating’ after a few fasteners are removed from the crinoline rings and the crown brackets, and then the bands removed. In practice, on a half century-plus old locomotive, those fasteners are likely to be rusted solid, riveted, missing or welded – and we found all four issues on this rusty old grommet. What puzzled us was how awkward those welds were to get at in the first place – what a nasty job that must have been. It looks as though those plates had been removed before and were too distorted to be retained in shape with the fasteners and the boiler bands alone.





P07 - The stubborn sheet-steel boiler cladding is being winched off via one of the conveniently placed brackets of the smoke deflector. The metal work is a bit scruffy but not too rusty. But it needed to come away to reveal the boiler for a good visual inspection during the coming boiler testing phase. The boiler was known to be prone to external leaks. We suspect that we have found already some in the flank stays of the firebox, because of the previously hidden lime scale traces that were there.



P08 - With his head 'framed' by the smoke deflector's rear hanger, Robert Cousins is doing the first pass of pneumatic-powered wire brushing of that exposed boiler shell. It is a LOT of area to cover and at all sorts of awkward angles too. The face mask is more for the remains of the fibrous thermal lagging than for the rust. When the boiler is cleaned, it is to be externally visually inspected and then coated with a good quality primer coat. The thermal lagging is to be replaced and new cladding sheets are to be made up – and sprayed with proper duco paint. We don't want to have to look at that boiler shell again for the next 20 years!



P09 - This is some of the boiler fitting detail that is revealed when the obstructive cladding and the thermal lagging is removed. This is the left side clack-valve mounting pad. Notice that the washout plugs have been cleaned, revealing their natural bronze colour. (Usually just a grubby oxidized black) These mounting pads always need checking as they can crack. The threaded studs are worn here and need to be replaced.



P10 - Here is a close up of some of the recently cleaned rivets at a lapped joint at a boiler course. You can still see the indented circumferential marks from the riveter guns from so long ago. It would seem that the thick platework used in a steam locomotive's boiler could never rust out – but deep localized pitting on a neglected locomotive can render a boiler unusable. That's one reason why we have to thoroughly sandblast and externally check the Class 12R No.1947's (Rosie) boiler – just for the rust that developed on an unprotected boiler shell under neglected cladding and water-absorbent thermal lagging.



P11 - Here is the class 15F all stripped down with a 'poodle cut', with the exposed boiler shell glowing in the late afternoon sun. That smokebox front plate and door needs to come off to resolve a leak situation. But we found yet another bodge job in the reconnaissance for the process – the headlamp is WELDED into position. The final product is to be spray-painted in duco-based gloss black, with no white trimming or lining. She will run with a black etching-primer smokebox above a red buffer beam, and with bare steel wheel rims around black wheel centres. She will also permanently display a commemorative plaque to credit those who donated towards the restoration.

The front buffer beam looks oddly pale because the endless layers of red paint are being chipped off.



P12 - All that rust has to go somewhere and a lot of it just sifted down onto the running boards. A whole lot of rust came off that boiler and it wasn't considered to be 'all that rusty' as steam loco boilers go.





P13 - 15F No.2914 has a sullied reputation for being a poor steamer under load, although she usually fires up and steams up OK at standstill. During the stripping work, we found that the smokebox front plate doesn't lie flat and the gap was sealed with what looks like window putty! No conventional steam locomotive will run well with a reduced vacuum in the smokebox, irrespective of the boiler's internal condition or the skill of the coal-cat at the other end. Incidentally, this shows one reason why Reefsteamers is eliminating the traditional heat-resistant graphite paint from our fleet. When thickly applied, it can cover a multitude of sins!



P14 - Simon Bennett is pictured using a ratchet winch to drag that piece of cladding out – even though the extra belly welds had already been cut away. Note that this sheet is properly marked 'L1' for 'First Course – Left'. You can see how the rear side of the sheeting has started to rust. The strange looking protruding cylinders are 'inside-out' sleeves for the washout plug pockets.



P15 - Adjoining locomotives form great anchor points for winching and the Class 15CA No.2056 'Dorothy' serves in that role here.



P16 - Standing safely out of the way of straining webbing and watching the fun!



P17 - McCarthy's law of locomotive repair came firmly into play and the loose bits were filling up both aisles and washing up against the wheels. (McCarthy's law says that removed pieces of locomotive, and the tools used to remove them, will automatically spread out evenly to fill all the available working area until a solid obstacle is reached.)



P18 - The plates on the right side of the locomotive came off a lot easier as the welds had been removed. But the front two plates still needed to be winched to get over the obstruction presented by the reverser.



This Depot Report was compiled by Mr. Lee D. Gates on behalf of Reefsteamers Association NPC.  
For observations, corrections and suggestions – email me at [documenter@reefsteamers.com](mailto:documenter@reefsteamers.com)

**CONTACT DETAILS :****Postal Address :**

P.O. Box 1736, Germiston 1400

**Depot Phone** = (011) 025-4363

**Depot Mobile** = 083 651 5424  
(Attie de Necker)

Enquiries = [chairman@reefsteamers.com](mailto:chairman@reefsteamers.com)

**Bookings and Marketing :**

Bookings : [bookings@reefsteamers.com](mailto:bookings@reefsteamers.com)

Marketing : [marketing@reefsteamers.com](mailto:marketing@reefsteamers.com)

**Reefsteamers Web Master :**

[webmaster@reefsteamers.com](mailto:webmaster@reefsteamers.com)

**Reefsteamers Web Site :**

[www.reefsteamers.com](http://www.reefsteamers.com)

**Reefsteamer Facebook :**

<https://www.facebook.com/groups/reefsteamers/>

**MOTIVATION :** The Reefsteamers Depot Reports and associated Photo Essays are created on an unpaid volunteer basis in my leisure time, for the love of steam.

**COPYRIGHT :** **This document may be freely distributed as it is.**  
**The contact details and copyright notice must remain intact.**

This document is not to be sold. This document is not to be included in whole or in part in any other media, whether optical, laser disk, flash, magnetic, printed – including forums, websites and newsletters, without the prior permission of the Author or that of the Board of Directors of Reefsteamers Association NPC.

**INFORMAL PUBLICATION CONDITIONS :**

As I have a full time job, as well as being active at the Reefsteamers Depot, I cannot and will not make promises concerning the timing of releases. Reefsteamers Association NPC will not accept accountability for regular releases and website updates of this material.

Owners of locomotive(s), rolling stock, equipment and machinery will be given material for reports and photographs by me upon request and not necessarily through a Depot Report or a Photo Essay.

**DISCLAIMER :** **The views and comments contained herein are my own views and observations, and are not necessarily those held by Reefsteamers Association NPC.**

Due to the nature of this type of work, Reefsteamers Association NPC will not accept responsibility for loss, damage or mis-information due to the contents of Depot Reports, Photo Essays or other related Articles. Information included here is verified on a best-effort basis.