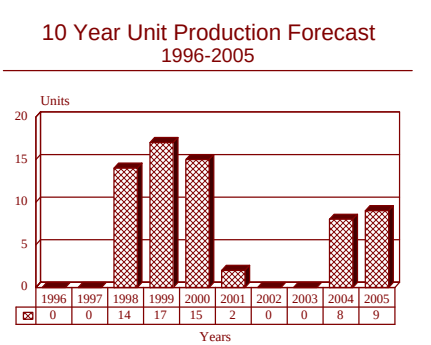
Ysterarend - Archived 8/97

Outlook

- Continued production forecast.
- Export sales forecast.



Orientation

Description. A wheeled vehicle

Sponsor. The development and expected South African procurement of the Ysterarend is being sponsored by the South African Department of Defense through ARMSCOR (the government procurement agency) and the South African Army.

Contractors. This vehicle was designed and developed by Mechem Consultants (a component of Denel Limited) and is to be manufactured by another as yet unknown component of Denel, Hennopsmeer, Republic of South Africa.

Licensees. None

Status. The development and operational testing of the Ysterarend is ongoing.

Total Produced. As of January 1, 1996, a total of three Ysterarend prototype and developmental vehicles had been manufactured.

Application. A light multipurpose armored vehicle designed for use by the South African Defence Force parachute battalions.

Price Range. In equivalent 1996 United States dollars, the unit price of the Ysterarend vehicle armed with an M40 recoilless cannon is $155,000.

Technical Data

Crew. Three: commander, gunner and driver

Configuration. 4x4

Dimensions. The following data are for the latest developmental Ysterarend vehicle fitted with the M40 106 millimeter recoilless cannon.

	SI units	**US units**
Length	3.6 m	11.81 ft
Width	2.1 m	6.89 ft
Height	1.74 m	5.71 ft
Combat weight	4.23 tonnes	4.66 tons
Fuel capacity	90 liters	23.94 gal

Performance. The maximum speed and range figures are on hard earth surfaces.

Maximum speed	105 km/h	65 mph
Maximum range	378 km	234.7 statute miles
Step	47 cm	1.54 ft
Trench	78 cm	2.56 ft
Slope	26%	26%
Gradient	64%	64%
Fording	1.2 m	3.94 ft

Engine. The Ysterarend uses a rear-mounted six cylinder liquid cooled diesel engine of unknown designation. This engine is rated at 92 kilowatts (123.32 horsepower) at an unspecified engine speed. The manufacturer of this engine is undetermined. The power-to-weight ratio is 21.75 kilowatts per tonne (26.46 horsepower per ton).

Gearbox. The Ysterarend is equipped with an unspecified manually operated unit with four forward and four reverse gear ratios and a transfer gearbox with two gear ratios. The manufacturer of this equipment is undetermined. Two or four wheel drive can be selected while the vehicle is moving.

Suspension and Running Gear. The Ysterarend has each axle supported by coil springs and double acting hydro-pneumatic shock dampers. Radial type 12.50x20 run flat tires are standard. A hydraulically operated dual braking system is fitted; disc brakes are used.

Armament. The main armament of the Ysterarend is the M40 106 (actually 105) millimeter recoilless cannon originally developed and manufactured by the United States of America. The M40 was (and still is) subsequently traded in a major way on the international market; has also been (and still is) manufactured by a number of other nations. In the Ysterarend, the M40 is mounted on a pallet which can be quickly removed so different armament can be fitted as per need. To date, test fittings have been made for the MILAN anti-tank guided missile system, an 81 millimeter mortar and the R107 multiple rocket launcher. In addition, a 7.62 millimeter machine gun is pintle mounted in the turret on the right side of the crew compartment.

Variants/Upgrades

As of mid-1996, there are no variants of the Ysterarend although at least two (one an ambulance) are being studied. Because it is a new vehicle there are no modernization or retrofit programs for the vehicle.

Program Review

Background. For over two decades, the Republic of South Africa has had to systematically replace and expand its inventory of light wheeled vehicles to overcome or neutralize the export policies of former arms suppliers due to the United Nations imposed arms embargo. Some of these vehicles have become well known in the world due to their robust design and manufacture. Even as the Republic of South Africa began the process of re-entering the mainstream world community, the nation was still developing armored vehicles suited to the country's unique requirements. Among the latest of these vehicles is the Ysterarend (Iron Eagle). This vehicle was designed for use by the South African Defence Force parachute battalions, which have to replace several different types of increasingly obsolete vehicles. The Ysterarend vehicle is another example of the South African expertise and experience with wheeled vehicles that are ideally suited to the country's climate and terrain.

Development of the Ysterarend began in 1989; the development phase included extensive operational testing and input from the user community. To the greatest degree possible, the design of the Ysterarend incorporates standard commercially available automotive components. To that end, the Ysterarend is largely based on the famous Unimog truck manufactured by Daimler-Benz of Germany. This was done in order to reduce both the procurement as well as the life cycle costs. Following a number of changes that resulted from the operational testing and user input, the vehicle was accepted for service in late 1992 and preparations for the initial low rate serial production commenced in 1994 as operational evaluations continued.

The Ysterarend was designed primarily as a multi-mission (reconnaissance and personnel transport duties) vehicle for airborne units. The Ysterarend can be air-dropped by C-130 (which can carry three Ysterarend vehicles) or similar class aircraft. Five parachutes are

used for each vehicle. After the Ysterarend is landed, approximately ten minutes are required to prepare the vehicle for use.

Vehicle Description. The monocoque hull of the Ysterarend is fabricated of all-welded steel alloy armor providing complete protection from armor piercing projectiles up to 7.62 millimeters in calibre as well as ballistic fragments. Great attention has been directed to protecting the vehicle against the effects of landmines. The Ysterarend vehicle is designed to protect the crew from the effects of a landmine detonating under any one wheel. The forward portion of the vehicle is reinforced so as to prevent damage when operating in areas of heavy vegetation; the Ysterarend is able to run down small trees without damage.

The crew compartment is in the forward part of the Ysterarend vehicle with the driver seated in the front center of the vehicle. The other crew members are seated to either side and slightly to the rear. Immediately behind the driver is a shelf on which can be mounted up to four tactical radios. Access to the crew compartment is by a hatch on the roof. Bulletproof windows are positioned to the front and sides of the crew compartment; these windows provide an excellent field of vision, even when the vehicle is closed down. The windows can be quickly covered with armored shutters as required.

The engine and gearbox are located at the rear of the vehicle to the left. A fan blows hot air out louvers mounted at the rear of the vehicle. In relation to the unique environmental conditions found in southern Africa, a specially designed cooling system has been developed for this vehicle. This system features an engine compartment cooling system using a separate fan. The engine radiator and the cooling fan are mounted on the right side of the vehicle. The entire engine compartment and engine cooling system design is optimized to preclude clogging by leaves and other foreign matter.

The M40 recoilless cannon is mounted on a pallet which is in turn carried on the rear of the vehicle over the engine compartment and magazine. In addition to serving as a mount for the main weapon, the base of the pallet provides additional protection for the magazine. The M40 can be manually traversed 360°. The pallet which can be quickly removed so different armament can be fitted as per need. To date, test fittings have been made for the MILAN anti-tank guided missile system, an 81 millimeter mortar and the R107 multiple rocket launcher. In addition, a 7.62 millimeter machine gun is pintle mounted in the turret on the right side of the crew compartment.

Funding

The development of the Ysterarend has been funded by the South African Department of Defense through the South African Army.

Recent Contracts

Not available as contractual information is not released.

Timetable

The following timetable is for the Ysterarend program only and in no way relates to the several other similar vehicles developed by the Republic of South Africa.

Early	1989	Design conceived, engineering development initiated
	1991	First prototype completed
	1991-1992	Developmental and operational testing
Oct	1992	Design approved for production
	1994	Preparations for low rate production began
Mid	1996	Development and operational evaluations continues

Worldwide Distribution

Export Potential. The Republic of South Africa is one of those countries that has long found itself ostracized by the world community. The sanctions imposed by the United Nations have severely handicapped the country's efforts of selling armaments on the world market. Now that these sanctions are being lifted and the country is returning to the mainstream international community, the prospects for the export of the Ysterarend may be better than some of the other military programs developed by this nation in the past.

Regarding the potential for domestic procurement, the Ysterarend appears to be just the thing that the Republic of South Africa needs. In addition to re-equipping the airborne units, the Ysterarend should also be able to replace several increasingly obsolescent and difficult-to-maintain vehicles in the inventory. The fitting of the M40 recoilless cannon is an excellent feature as this weapon, firing the latest pattern ammunition, can handle anything that moves. The mounting of the main weapon on a replaceable pallet is also an excellent design feature, greatly enhancing the tactical flexibility of the vehicle, and one that should aid in its marketing.

Countries. **Republic of South Africa** (three developmental prototype vehicles).

Forecast Rationale

Our new review of the Ysterarend program has found that the program has not proceeded as rapidly as we previously forecast. This slippage is probably a result of the greatly diminished threat scenario as now perceived by South Africa as well as increasingly tight defense funds. Our research still indicates that the Republic of South Africa's initial procurement objective is for 50 vehicles. In addition, we forecast additional production to meet the attrition losses of several other types of similar vehicles; some of these vehicles have been in service for three decades. We also include some limited export of the Ysterarend in our forecast chart. Of course, due to the still somewhat volatile nature in the Republic of South Africa, the demand for this vehicle could jump on short notice. We will continue to monitor this program and update this report on an interim basis if warranted.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR PRODUCTION

			High Confidence Level			Good Confidence Level			Speculative				
Vehicle	(Engine)	through 95	96	97	98	99	00	01	02	03	04	05	Total 96-05
REUMECH OMC													
YSTERAREND(a)	UNSPECIFIED	3	0	0	14	17	15	2	0	0	8	9	65
Total Production		3	0	0	14	17	15	2	0	0	8	9	65

(a) The through 1995 production is the three developmental prototypes.