

Refrigerator Operations

By Steve Sandifer

Reefer Operations on Model Railroads

with an emphasis on the ATSF

January 1, 2003

I must begin by saying I model the Santa Fe Railroad in eastern Kansas during the transition period of 1950-53. Emporia was the home to a large Armour meat processing plant and the largest cattle feeding station on the Santa Fe. The Howard Branch that headed south was in the bluestem grass region known for fattening cattle on their way to market.

Please forgive me if I don't speak to your exact interest, but my specialty is the ATSF, 1950-53, Emporia Kansas and the Howard Branch.

The following topics are covered in this document.

- Types of Reefers
- Reefer Loads
- Icing Stations
- Ice Sources
- Prototype Operations
- Model Operations
- Resources

HO models are covered in a separate document on this website

Types of Reefers

A reefer is a reefer is a reefer - right. Wrong. As the October 2002, issue of *The Dispatcher's Office* states, "there was no such thing as a refrigerator car suitable for general service." Reefer users could be divided into at least four broad groups.

- **Meat reefers** had special meat rails for handling sides of meat and brine-tank refrigeration to enable lower temperatures. Most meat reefers were owned or leased by meat packers.
- **Dairy and poultry** producers required refrigeration and special interior racks.
- **Fruit and vegetable reefers** were generally used for long distance shipping. This need tended to be seasonal and included FGEX, PFE, WFEX and SRDF reefers.
- Manufactured foods such as canned goods and candy as well as beer and wine that did not require ice but did need protection of an **insulated car**. Remember that no beer and wine was produced between 1920 and 1933. The AAR classified non-refrigerated insulated boxcars as reefers.

In addition, there were both freight and passenger express versions of many of these cars.

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Santa Fe offered 9 different forms of ice service to fruit and vegetable shippers. Services varied as to who was responsible for precooling, icing, and re-icing the cars. Also, the cars had various combinations of air circulating fans, steel floor racks, dry floor racks, cubic capacities, bunker sizes, collapsible bunkers or sliding doors. Many shippers would not accept substitutes. Some examples:

- Wine - 50' cars
- Citrus fruits required standard 40' cars with 9,000-pound bunker capacity. About 70% of cars for oranges must be fan-equipped.
- Dry wood and steel floor rack were required for cardboard carton shipments.
- Certain fruits, such as grapes, tree fruits and melons required fan cars but with 10,000-pound bunkers. Grape shippers generally requested steel floor racks and sliding doors to help with the use of a fork lift truck.
- Potatoes and onions did not require fan cars and could use lower bunker capacity, though some shippers did request fan cars.

The 1950 AAR codes list 11 types of reefers:

- BR - Passenger express reefer.
- LRC - Special car type: heavily insulated, designed primarily for the transportation of Solid Carbon Dioxide.
- RA - brine tank refrigerator, primarily for meat.
- RAM - RA equipped with beef (Meat) rails.
- RB - Beverage, Ice, Water or Vinegar refrigeration. Much like RS but without ice bunkers.
- RCD - solid Carbon Dioxide refrigerator.
- RP - mechanical reefers with independent power.
- RPA - mechanical reefer powered by mechanical drive from car axle.
- RPB - mechanical reefer powered by generator from car axle.
- RS - ice bunker reefers.
- RSM - RS with beef (meat) rails.

The 1941 edition of SFRD Circular 2-J, *Rules and Regulations Governing the Handling of Perishable Freight*, lists 15 types of reefers.

Since I am modeling the ATSF in 1950-53, my expertise excludes mechanical reefers and focuses primarily on reefers for perishables and the Armour packing plant in Emporia.

Prior to 1940, most reefers had wood bodies, wood sides, steel ends and roofs. This was partly because wood was such a good insulator. All steel cars began in 1936 but did not take off until after WWII. Ice reefers continued in service until the early 70s.

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Mechanical reefers were developed around 1950, but they cost twice as much to build. Railroads were slow to make that change. At the same time, they were being developed, the frozen food industry was blossoming requiring lower temperatures for reefers and more precise control of temperatures. The same technology that made mechanical reefers possible, made mechanically refrigerated highway trucks possible, thus leading to a massive decline in rail reefers.

The predominate use of reefers were for moving produce. Most railway owned reefers were in produce service. Meat packers primarily owned their own reefers, predominately 36' reefers. Most slaughterhouses were in the Midwestern states and shipped their meat to the large metropolitan areas east of the Mississippi. In the 70s, many packing plants and railroads teamed up so that meat was loaded into refrigerated highway trailers and loaded on TOFC flats at the packing plant for initial movement to distribution points.

In 1930, reefers reached their peak with 181,000 in service. That dropped to 127,200 in 1950 and 80,000 by 1980. Another interesting statistic compares the private ownership to railroad ownership. In 1930, 78% were privately owned, 85% in 1950, but only 16% by 1980. Armour, one of the major players early on, had 12,000 reefers in 1900 - 20% of the national fleet at that time. In 1950, 70% of the cars were owned by 5 companies:

- Pacific Fruit Express (UP/SP controlled) - 38,840 cars
- Santa Fe Refrigerator Dispatch - 14,514 cars
- Fruit Growers Express - 12,063 cars
- American Refrigerator Transit (Wabash & MP primarily) - 11,457 cars
- Merchants Dispatch (NYC controlled) - 9,690 cars

Billboard reefers were outlawed by the ICC in 1934. There is a very informative article on this in the October 2002 The Dispatcher's Office.

Keith Jordan has supplied a roster of ATSF Ice Reefers. Files appear separately on this website.

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Reefer loads

June 30, 2014

In 1955, there were 1,387,000 carloads shipped in reefers. The breakdown is as follows:

Product	Carloads (000)	% of total
Meat and packing house products	299	21.6%
Fresh fruits	257	18.5%
Fresh vegetables	207	14.9%
Manufactured food products	196	14.1%
Potatoes	191	13.8%
Beer & malt liquors	75	5.4%
Cheese & dairy products	58	4.2%
Containers returned empty	16	1.2%
All other	88	6.3%

What's in Those Cars, Anyway? The Dispatcher's Office, January 2000, pp. 6-10.

Santa Fe reefers, like Pacific Fruit Express, were for produce. Of its entire fleet, Santa Fe only had 30 ice reefers ever which had meat hook racks, and these appear to have been used for on-line Harvey House service, or possibly a dedicated service to a packer and market. These were too few to have any impact on the overall fleet.

Most meat packers, Armour, Swift, Cudahy, etc., had huge fleets of their own cars to ship meat from slaughterhouse to market. You would not find a SFRD reefer at the local packing plant. Most meat reefers cycled from packing plant to warehouse and back, with regular stops at company owned shops for cleaning and repairs.

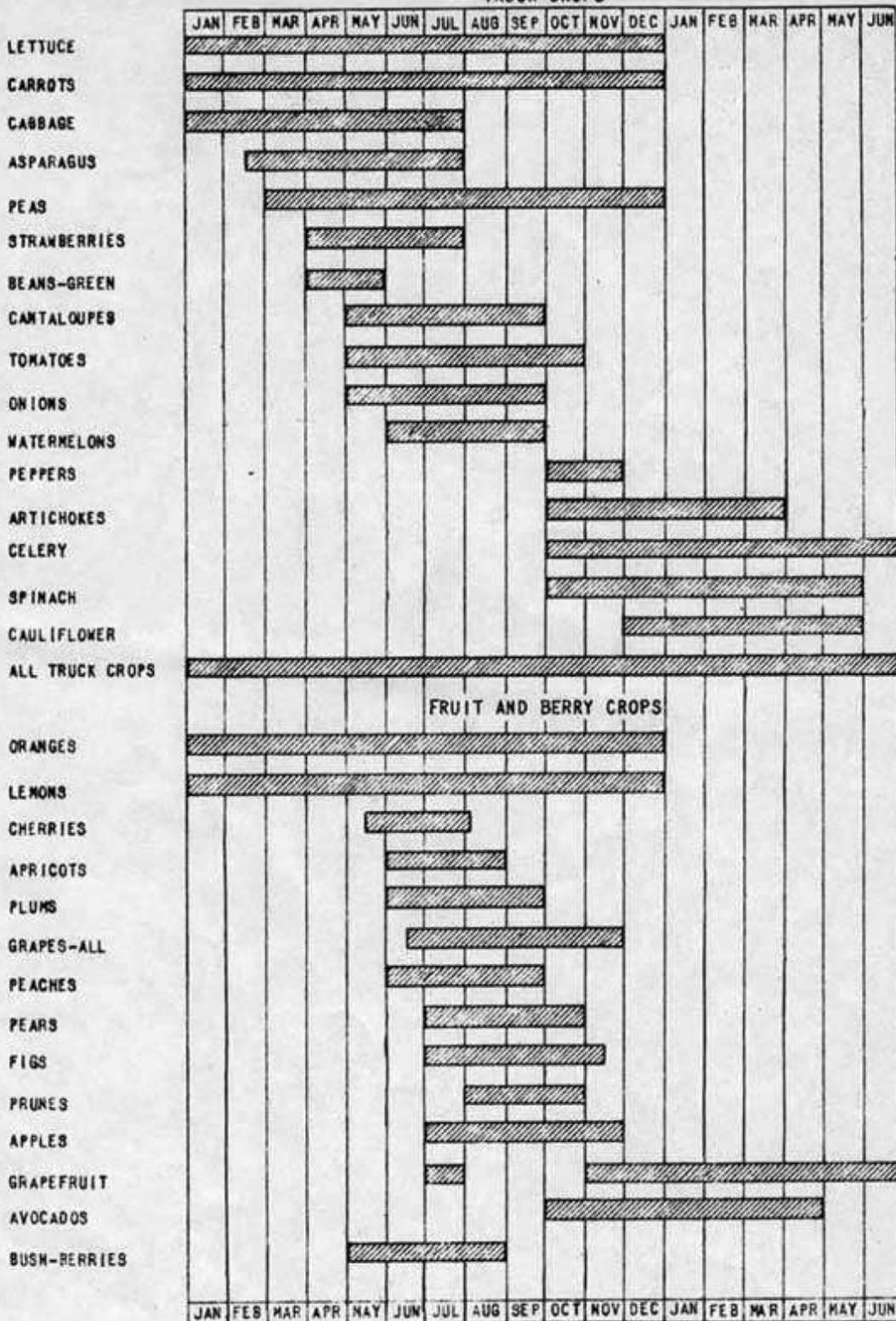
One major crop of the 40s and 50s were potatoes from the Bakersfield, CA, area. 85% of the national supply came from there with peak shipments in June. Keith Jordan has supplied an ATSF chart of the California growing season, dated 1944, which would account for much of the SFRD shipments. This appears on the following page.

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TABLE

CALIFORNIA MAJOR HARVESTING PERIODS OF TRUCK, FRUIT, BERRY AND MELON CROPS



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Depending on the seasonal needs, empty reefers from one railroad could be moved to another to handle reefer shortages. Santa Fe reefers have been documented hauling fruit from Florida to Chicago.

Railroads were not eager to run their produce reefers back home empty unless they were in great demand for another trip east. In less hurried seasons, common dry loads would include newspapers and magazines from East Coast publishers, all manner of clean items, such as canned goods and boxed items, or LCL shipments from people like the mail order houses in Chicago or Kansas City. During the holiday season in the early 50s, Santa Fe ran a daily train westbound of approximately 60 reefers between Chicago and California operating on passenger schedules. The cars carried westbound Christmas express traffic and bulk mail.



Ben Perry wrote, "During the early and mid 1960's the New Haven RR would operate mail extras during the December Holiday rush between Boston and New York. These trains would consist mostly of 40-foot reefers (not express reefers) with various railroad reporting marks such as FGE, WFE, SFRD, and PFE."

Tim Gilbert wrote, "There were commodities which could be carried in car load lots on west bounds. Among the westbound commodities carried on the UP between Laramie & Rawlins in the Fall of 1947 according to a Conductor's Wheel Report was produce not produced in the Far West - Bananas, Grapefruit, et al.; beverages; canned goods; as well as wool, machinery, appliances, tires."

Bill Messecar reported, "The results of our effort to reduce empty westbound refrigerator car movement are shown by the fact that in 1954 we handled 62,902 loaded SFRD refrigerator cars eastbound into Belen and in the same year moved west from Belen 43,107 empty SFRD cars and 20,221 loaded SFRD."

Also, in peak seasons, entire trains of empty reefers would be expedited from Chicago back to California to cover the tremendous reefer need.

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Damage claims ran high with perishable goods, often more than 10%. In 1949, the Pennsylvania reported 17% damage losses.

Reefers in LCL Shipments

Many westbound reefers were used for Less than Carload shipments. A railroad would normally substitute 2-3 reefers for one boxcar, which was ideal for LCL shippers. Santa Fe developed the Mahoney transload facility near the west end of Argentine Yard in Kansas City. Box cars of LCL goods were brought to Mahoney where they were transloaded into reefers for various western destinations. Of course, empty reefers or those hauling nonperishable freight could be found anywhere in the train, not just at the headend.

One drawback to using reefers as boxcars was the door width. The Santa Fe standard was 5', while most railroads had 4' doors. Loading was by hand truck. The sliding plug door first appeared on Santa Fe cars in 1949, helped make the inside more accessible to fork lift trucks. This was the same period where box cars were moving from 6' to 8' doors. Yet another concern was that reefer doors hinged outward, meaning they required just over 30" of swing clearance. Sliding doors required virtually no clearance to loading doors. If clearances were too tight, the doors of reefers would have to be opened before the car was set for unloading and closed after the car was pulled with a load.

As a comparison, a BX-37 class 40' boxcar had internal dimensions of 40'6" long, 9' wide, and 10'4" high for a total of 3,766 cu. ft. The 40' RR-29 class reefer, rebuilt around the same time, had internal dimensions of 33'2" L x 8'2.5" W x 7'9" high for a total capacity of 2,110 cu. ft. Insulation and ice bunkers took up the rest of the space in addition to the overall car being shorter.

Tim Gilbert reported:

"Reefers were used in LCL service only when there was a boxcar shortage. Reefers were substituted in LCL service for boxcars in Chicago, Kansas City and other points in the Midwest in order to provide primarily a supply of empty boxcars for grain loading."

"The three reefers for one boxcar rule pertained only for carload lots which specified a minimum weight to qualify for the carload lower rate. There was no minimum weight for an LCL car except during WW II. (Exception: During WW II when there was a minimum ten-ton weight for loading an LCL car, the three reefers for one boxcar provision was applied to LCL cars.)" John Barry has supplied a *"History of Substitution Arrangement of Refrigerator Cars for Box Cars on Westbound Transcontinental Traffic."*

"Another complication using reefers in LCL service was that they could be routed only in one direction vs. a boxcar which could be sent almost anywhere - car rules about reloading empties only in the direction of their home road was largely ignored, and nowhere more than in LCL service."

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"Once a boxcar was put into LCL service, it was apt to stay in it for a while until that boxcar was unloaded at a station which could not reload it. Refer to the routing of C&O #1 in Mono's ad on pages 56-57 of the September 1948 *TRAINS* magazine. #1 was loaded in Crawfordsville IN on June 16th, 1947 and remained in LCL service until July 16th, 1947 traveling to Louisville KY, Montgomery AL, Miami FL, Savannah GA, Atlanta GA, Macon GA, and Hamlet NC before being spun out of LCL service near Columbia SC. There was no such luxury with reefers. Their services were required near the fields to ship their produce to eastern markets."

"C&NW's Proviso Transfer also had the capability to use reefers in LCL service without upsetting much the LCL unloading/loading function. First, incoming LCL was unloaded on separate tracks than those used for outbound load. Furthermore, cars on each inbound and outbound track could be served directly from a platform which meant packages did not have to be hauled through a multitude of car doors on parallel tracks. Because of these platforms, a string of reefers could be set on one track, loaded for certain points to the west, and could be pulled somewhat more independently than for a station where loading was done through car doors on adjacent tracks where one pull could shut down loading operations for the entire freight house."

"According to a Fall 1947 UP Wheel Report for cars between Laramie and Rawlins, WY, about 30% or 43 of the 145 westbound LCL car loadings were in reefers. 31 of the LCL-toting reefers were owned by PFE while another five were owned by SFRD."

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Icing Stations (May 21, 2005)

If a car was to be iced, it frequently began its day at the ice house getting iced up. Six men working as a team could ice a car in 90 seconds. 300-pound blocks of ice would be moved along skids and men with sharp pronged forks called bi-dents knew how to hit the blocks to break them into chucks with great rapidity.

Once cool and loaded with the initial ice, the car was ready to go to the shipper.

After the car was loaded by the shipper it was returned to the icing platform for topping up. In the case of produce, it would be pre-cooled. Keith Jordan reports, "The purpose of precooling was to take the latent field heat out of the citrus. Typically, the cars were pre-cooled before shipping. I'm sure some cars were pre-cooled when empty, but probably for spotting at packing houses which had precooling rooms, thus putting cool fruit in a cool car. Warm fruit in a cool car would only bring up the ambient temperature. Pre-cooled loads used less ice en route." In better equipped areas, a system of flexible ducts was connected to the reefer hatches and cold air was blown through the car, like modern air conditioning. This process took about 4 hours. White's book shows a portable truck mounted pre-cooling rig which could be taken to the packer. Santa Fe opened their pre-cooling plant in San Bernardino in 1910.

ATSF promo film, "At Your Service," dated 1947. It says, "This is our San Bernardino precooling plant. By blowing cold air into cars, temperatures are lowered even before the cars are spotted for loading."

In some cases, this was not only filling the ice bunker, but also opening the door and blowing crushed ice over the top of the load. Such blown in ice would freeze together to form a nearly airtight seal around the product.

Iced reefers could usually operate for 24 hours between icings.

Icing machines came to the Santa Fe in 1949 and cut the icing time in half. A full 100 car reefer train could be reloaded and on its way in under an hour. Many docks had only one icing machine, but the more prominent stations on the Santa Fe had several.

The SFRD Rule book prescribes the amount of ice and salt to be added, as determined by the content of the car and the month of the year. For instance, dressed poultry would receive 6000 lbs. of crushed ice with 10% salt in December, while butter would receive no ice at that time of year. Fresh fish would receive "chunk ice to capacity" regardless of the season.

Not all reefers required icing. If they were being used in ventilation or insulated car service, no ice was necessary. Portable charcoal heaters were installed in the bunkers of ice reefers as necessary to prevent freezing in very cold weather. After the 1940s, propane was the fuel for these units.

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The SFRD rule book prescribes ventilation procedures for various perishables at various temperatures. For instance, for avocados or tomatoes vents were to be open above 45 degrees and closed below that temperature. For coconuts, pineapples, sweet potatoes or yams the magic number was 40 degrees. For apples and pears, the vents were only open between 32 and 45 degrees; they were closed above and below those figures.

Of course, mechanical reefers also required a different type of servicing. They could operate approximately 2 weeks on full fuel tanks.

It was difficult to maintain a constant temperature in an ice reefer. For produce, the ice was to protect but not freeze the product. Ice alone would not cool below 35 degrees. Meat required frozen temperatures produced by mixing salt with the ice, much like a home ice cream freezer. A mixture of 30 percent salt to 70 percent ice resulted in a temperature of -6 degrees, but this caused the ice to melt much faster requiring more frequent icing and producing highly corrosive saline liquids that destroyed steel underframes, trucks and wheels, bridges, rail, and turnouts. Later cars were required to have brine tanks to catch the melt, but enough leaked out to be a headache to the railroads.

Not all icing took place at icehouses. Express reefers and reefers serving small industries might be iced from a truck. A wooden ramp would be placed against the car and the ice hoisted up to the roof. Often the rope pulley was attached to the bumper of the delivery truck and the ice was hoisted to the roof as it backed up.

Since express reefers were not often pulled from a passenger train for icing, another method used by railroads was to build an icing platform on the roof of an old box car. Frank Ellington described the Shopton car as 'painted work service gray and carrying Santa Fe's "WK-" lettering, that car had a flat-deck platform fixed almost the complete length and width upon its roof.' This icing car would be taken to the ice dock and ice was placed on its roof. Then it was moved to the passenger depot and spotted on a track next to where the anticipated express reefer would stop. Once the passenger train was spotted, planks were placed from the ice car to the roof of the express reefer and the ice transferred. This was dangerous work as engineers pulled out when they were ready, icing completed or not.

The Hobart Ice Plant (Los Angeles) was in full operation up until approximately February 1962, at which time the operation there was downsized. Operations at the San Bernardino ice plant were suspended in December 1972. The plant, which was built in 1909, was torn down in September 1973. The Newton, KS, Ice Plant was torn down in 1967.

The world largest refrigeration plant was PFE's Roseville, CA, plant. It could produce 1200 tons of ice a day and had a storage capacity for 52,000 tons. The icing decks could handle 254 cars at one time.

D. K. Spencer worked one summer at the Needles, AZ, icing facility and has posted a report.

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For some photos from the 40s, go to the [Library of Congress](#) and search for "railroad ice." When you find a photo you like, click on the "Display neighboring images in the collection" to find more like it.

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Ice Sources

January 12, 2003

In cold climates, ice for reefers was harvest in the winter, stored in large warehouses, and kept until needed. It is hard for moderns to believe that properly stored ice would last through the summer in such facilities. Railroads would have large ice farms dedicated to this procedure. Blocks were cut to uniform size, usually 22" wide by 22 or 33" long, with the thickness determined by nature. The minimum thickness required was 5", but many were up to 15" thick. For the Santa Fe, Gallinas Canyon near Las Vegas, NM, was one of the better natural ice sources. After the 1930s, it became uneconomical to move ice from this location to ATSF ice houses, and this facility was closed in favor of artificially manufactured ice.

The larger mechanical ice plants on the railroads would produce ice all year long and stored as 300-pound blocks in large warehouses.

Railroads maintained a fleet of ice cars for the purpose of moving ice from their plants to wherever it was needed. Some ice plants simply could not keep up with the demand, so surplus ice from one plant would be moved to another or to stations that had no ice facilities. The Santa Fe used old reefers or old boxcars for this purpose and often ran them until it was not economically feasible to rebuild them. Some of their old truss rod reefers remained in service until 1956. The Santa Fe operated 300 ice cars in 1941, 313 in 1951, 171 in 1961, 111 in 1971. The fleet was retired or moved to MOW service in 1972.

More information on salt and ice cars can be found in both the Reefer book and the Boxcar book published by the Society. The boxcar book notes that between 1953 and 1954 Santa Fe converted 35 BX-3 and BX-6 boxcars to Ice service. They had their sliding doors removed and refrigerator doors added. Some received radial roofs. In 1956, 25 cars of the BX-12 class were converted to ice cars by adding insulation, floor racks, and surplus refrigerator doors.

The Santa Fe Live List book shows BX-24 (former KCM&O, truss rod frame) series 40100-40141 being converted to salt service in 1947 and given reefer doors. Photos are included in the boxcar book. These cars ran until 1954. In 1951 and 52, 45 BX-3 and BX-6 cars were converted to Salt service. They were routed from Hutchinson and Lyons Kansas. 42 of these survived until 1958 when they were converted to ice cars. In 1957, 30 BX-63 steel cars were converted to salt service with one car operating until 1973.

Railroads also had fleets of salt cars to service their icing facilities. Santa Fe had approximately 50 in service at any one time. These were box cars converted for this purpose. Most of Santa Fe's salt came from the Hutchinson, KS, area.

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Prototype Operations

April 15, 2005

In the blocking of a train, loaded stock usually ran directly behind the engine, followed by loaded ice reefers. Reefers were usually kept in a block and at the head end to expedite re-icing along the way. ATSF #42 which ran from Denver to Kansas City was an exception, where reefers were placed as a block on the rear from Dodge City to Newton to expedite switching in Newton.

In the 1950s, the ATSF ran several express trains which would have a high percentage of reefers. These could appear in a number of sections.

- GFX, all year train, out of Bakersfield or San Bernardino to Kansas City & Chicago. Total trip took 6 days.
- CTX, all year train out of San Bernardino to Dallas, Houston, and Galveston.
- BTX, all year train out of Bakersfield to Dallas, Houston, and Galveston.
- PVX, seasonal Palos Verde Valley Express from Blythe, California, to Chicago.
- SRX, seasonal (Nov. - July) Salt River Valley Express from Phoenix to Chicago with connection at Clovis to the Texas Express. 100 hours from Ash Fork to Chicago.
- HAX, seasonal Hereford - Amarillo Express to Chicago.

From anywhere ATSF served in California, delivery to Chicago was scheduled for the 6th morning. Bakersfield gathered cars from branch lines as far away as San Francisco (341 miles) and San Bernardino served as far as National City (154 miles).

The Indiana Harbor Belt delivered cars for the continuation of their journey eastward. The Erie carried Santa Fe's reefers to New York and Boston and to New England through the New Haven RR. Pittsburgh and Philadelphia shipments traveled via the Pennsylvania RR. The B&O picked up most Washington traffic.

Tom Casey reported, "I can attest to seeing frequent large blocks of Santa Fe reefers going through on the GTW out of Chicago in the late '50's and early '60's. These reefers appear in groups of a few cars and as many as a few dozen interspersed in an Eastbound fast freight. That implies there would be plenty of these reefer blocks destined for points in Michigan and, most likely into Canada, towards the Quebec & Toronto areas. Since GTW's connection to the Santa Fe was direct, end-to-end rather than PFE/UP interchange partners in the Chicago area; MILW Rd & C&NW (both connect to ATSF and GTW via IHB) I'm led to wonder if this led to a higher ratio of SFRD reefers over PFE cars in GTW trains. "

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The cycle for a produce reefer would general be as follows:

- The car would be cleaned with hot water or steam.
- It would be iced (not always).
- Then it would be delivered to the shipper.
- After loading the ice would be topped up. Some would be pre-cooled at this point (4-hours).
- Some required fumigation at this point.
- It would go out on the first available train.
- Roughly once a day re-icing would be required.
- It would be delivered and emptied.
- If in demand, it would be returned ASAP.
- If not in demand, it would be cleaned and used for a dry shipment back west or south.

One headache for railroads was the opportunity for a shipper to divert a load. In practice, this made the reefer into a rolling warehouse. The unsold produce was loaded in California and headed east. At any time, it could be sold, and that car would be redirected. These cars of unsold produce were known as rollers. Historically, 25% of the cars leaving California were rollers. The record for diversions for a single car was 29 times! Santa Fe subsequently changed the rules allowing for 3 free diversions before substantial charges were added. The major diversion points were Belen, Kansas City, and Chicago, but it could happen at nearly any location.

Bill Messecar provided a quote from the ATSF at a 1956 ICC hearing "In 1954 we accomplished a total of 43,581 diversions on perishables originating in Mountain-Pacific territory, approximately one-third of them at Belen, New Mexico. Aside from the telegraphing and clerical work involved in handling these 43,581 diversions, considerable additional switching was required."

Tim Gilbert reported: "Due to the number of days it took to get the produce to the auction block, shippers usually loaded and dispatched a car unsold. Page 379 of *Pacific Fruit Express* notes that 85% of the cars (in the Northwest) left the fields unsold. Tony Thompson wrote that the routing for most of these unsold loads was Chicago. Somewhere en route, the car would be sold to a broker. The car could be rerouted (diverted), held for a day to wait for a better market, or resold. Indeed, there was no extra charge for three of such changes. "

"Where cars were diverted could be determined by looking at a map. Any junction could be a diversion point. Belen, for instance, was the diversion point where reefers could be pulled from the Santa Fe's Chicago *Green Fruit Express* (GFX) trains to go to Denver; Clovis for Texas and the southeast; Kansas City for the St. Louis and beyond. Generally, however, most of the produce for the northeast from both the SFRD and PFE were delivered east of Chicago by the ERIE. At Huntington, IN, the ERIE's Train 98 picked up produce from ART; at Marion OH, cars for Detroit, Toledo, and Cincinnati could be dropped from the 98. At Akron, cars could be diverted to Cleveland and Pittsburgh; at Hornell NY, for Philadelphia via the RDG at Newberry Jct. PA; at Binghamton NY for northern New England including Boston; at Port Jervis NY, for southern New England via the New Haven. Finally, the residue of cars would be floated across the Hudson River to ERIE's Duane Street Market in the wee hours of the morning."

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"At auction houses like Duane Street, samples would be shown to buyers, and, then the auction would begin. Patsy Totaro, the green grocer from New Canaan, CT (where Tim grew up) would drive his van into Lower Manhattan every morning to pick and choose the produce which he would sell to the ladies of New Canaan the next morning. Patsy was somewhat typical of most green grocers in the area. Some super market chains like A&P, Gristedes, and Grand Union would likewise buy at the market. These chains, however, were somewhat at a disadvantage to green grocers like Patsy because they could only deliver produce via truck; hence, that produce would arrive much later in the day. Buying at auction houses provided the purchaser an opportunity to examine the quality of the goods before he bought."

"That's the way it was before the supermarket chains got their produce directly, and not through auction houses. Gherke's commented about the market preferring rail over truck because there was better intelligence of when produce would arrive. There was no such intelligence about the arrival of trucks which could distort the market. So, the decline of reefer traffic and green grocers could be attributed partially to super markets being able to circumvent the auction markets by getting their produce directly via trucks."

Yet another reefer operation through the 50s involved "Meat Peddler Cars," LCL meat delivery on local trains. Meat packers would take orders from butchers along a line and run a weekly route reefer to service them. This car was usually placed next to the combine or caboose and would stop at depots along the line to be met by the butcher. Such runs could be circuitous and could require up to 3 days to complete their deliveries.

When asked about the mix of non ATSF and ATSF reefers on ATSF trains in California, Andy Sperandio replied, "The SFRD cars dominate on the ATSF, of course, but many others could and did show up occasionally. I've spotted Fruit Growers Express, Western Fruit Express, Illinois Central, North Western Refrigerator Line, Northern Pacific, and Milwaukee Road (URTX) cars in Santa Fe trains or yards. That's in addition to the ART cars you mentioned, and of course the most common non-SFRD reefers on the Santa Fe were PFEs. And that's not counting the various meat packers' cars that brought loads into southern California - most of the major Midwestern packers had branch houses in California."

Stan Wilson, curator of the Shafter Depot Museum near Bakersfield, CA, reported that at the beginning of the potato season, virtually all cars would be SFRD cars. However, when the stockpile of cars was exhausted, the railroad would use any empty it could get its hands on including WFEX, FGEX, ART, MDT, BREX, BAR, REX, and even a meat reefer. He does not remember seeing any PFE provided by the ATSF in Bakersfield. Potato cars were often sent to the field clean, but not iced. They would be loaded, then fumigated, before being iced back in Bakersfield. Up to 700 loads would depart Bakersfield for the east in a single day.

Richard Hendrickson has written a most informative report tracing one SFRD reefer from Escondido, CA, to New York. (*Coast to Coast - The Journey of a Carload of Oranges from California to New York City Aboard a Santa Fe Refrigerator Car in October of 1947*)

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John More has transcribed a fascinating bit of testimony from D. A. Baumgartner before the ICC of September 5, 1956, which details the vast fluctuation between car needs at various times of the year, the need for extra locomotives and crews to handle that need, and the variations in the equipment required for various types of loads. You can find this on Jim Lancaster's Southern California Packing House website.

Baumgartner illustrated the variations with figures from 1955. Bakersfield shipped 507 reefers in January but 11,583 in June. At an average of 77 cars per train, that is a difference of 144 trains per month, with engines and crews. Glendale, Arizona, shipped 5 cars in September but 5,940 in November. At an average of 69 cars per train, this amounted to 86 trains per month. West of Belen, the Santa Fe loaded 2,168 cars in February but 17,033 in June. These cars had to be prepped and stored in anticipation of the rush. Of course, the need for local switch crews and way freights also varied to match this seasonal need.

The SFRD Rule book makes allowances for caretakers who might accompany a shipment via reefers. For sensitive perishables, they would be in charge of the heaters or icing and were to ride in the caboose. Caretaker's instructions supersede anything on the waybill but must be in writing.

Refrigerator Operations

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Model Operations

January 1, 2003

One frequent question asked by model builders is whether the roof hatches should be open or closed.

- The only time the hatches would have been fully open was for cleaning and icing.
- The ventilation position was used for loads like potatoes, onions, and bananas which didn't require refrigeration but needed air circulation and protection from temperature extremes. In those cases, the hatch covers were secured in the open position. On cars that had just been cleaned and had not completely dried inside, the hatch covers were sometimes left open (even thrown back in the full open position) while in transit, but this was not common practice. Contrary to old-time model RR lore, empties usually ran with the hatch covers shut to keep the interiors clean.
- Loaded cars with ice in the bunkers had the hatch covers closed. When in insulation or heater service they would be closed. On their return trip when being used as a box car, they would also be closed.
- Thus, as a general rule, reefers in trains had the hatch covers closed much more often than open.

A modeler with southern California as his prototype could keep very busy shifting reefers around from the cleanout track, to precooling, to the shipper, back to the ice house, and finally making up trains.

In the case of Emporia, long reefer trains ran through but did not require servicing. Ice facilities were located elsewhere on the system. Being a division point, waycars and often locomotives needed to be changed.

Those modeling Chicago or Kansas City could devote a large space to produce houses and the swift delivery of reefers to those tracks or to interchange with other roads.

Branch line operators could provide an LCL reefer for occasional operating sessions.

Westbound reefers could be used for LCL freight and might be switched out to the local freight house.

Don't forget the need for ice and salt cars on your railroad, or the possible need for express reefer icing, depending on your location.

The needs of a packing house will be treated separately.

I know little about the milk runs of the northeast, but considerable articles have been published on this subject.

Refrigerator Operations

By Steve Sandifer

Resources

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Email from: Keith Jordan, Andy Sperandeo, Richard Hendrickson, Mike Blaszak, Charles Schultz, Doug Harding, Clark Probst, Frank Ellington, Andy Sperandeo, Jim Hayes.